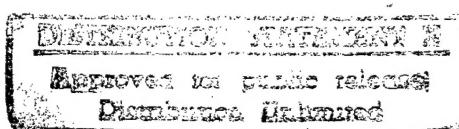


# ***JPRS Report***

## **Science & Technology**

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***USSR: Life Sciences***



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# Science & Technology

## USSR: Life Sciences

JPRS-ULS-91-016

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10 September 1991

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**Ion Translocation by  $\text{Ca}^{2+}$ -ATPase and Its Hydrophobic Component Prepared From Sarcoplasmic Reticulum of Rabbit Skeletal Muscles**

917C0278A Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 7 No 9, Sep 90 (manuscript received 26 Dec 88; in final form 13 Apr 90) pp 938-944

[Article by O. Ya. Shaturskiy, M. D. Kurskiy, T. P. Dibrova, A. N. Fedorov, V. B. Piskarev and A. N. Chanturiya, Institute of Biochemistry imeni A. V. Palladin, Ukrainian SSR Academy of Sciences, Kiev]

UDC 577.152.361:577.352.2

[Abstract] Studies on the mechanism by which  $\text{Ca}^{2+}$ -ATPase facilitates ion translocation across biomembranes involved insertion of the enzyme in BLMs, treatment of the proteoliposome with trypsin, and analysis of immunochemical and volt-ampere properties of the modified BLMs. The enzyme was isolated from the sarcoplasmic reticulum of rabbit skeletal muscles. Following reconstruction in BLM, the  $\text{Ca}^{2+}$ -ATPase continued to hydrolyze ATP and mediate active transport of  $\text{Ca}^{2+}$ . Trypsin treatment of the proteoliposomes cleaved the enzyme into a 45-55 kD hydrophobic fragment and a 50-55 kD hydrophilic fragment. Antibodies against the hydrophobic component showed that it alone facilitated ion transport across BLMs with the same selectivity as the intact enzyme. The antibodies were also used to demonstrate that in the case of the intact enzyme the hydrophobic fragment was imbedded into the BLM while the hydrophilic fragment remained exposed externally. Thus,  $\text{Ca}^{2+}$ -ATPase has been shown to form ion channels in BLMs, and that the channel-forming property is due to its hydrophobic fragment. Figures 6; references 14: 7 Russian, 7 Western.

**Induction of Nonspecific Permeability in Inner Mitochondrial Membranes by Hydroperoxides**

917C0278B Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 7 No 9, Sep 90 (manuscript received 23 Jan 90) pp 945-955

[Article by S. A. Novgorodov, T. I. Gudz, Yu. Ye. Kushnareva, V. A. Roginskiy\* and Yu. B. Kudryashov, Interfaculty Scientific Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni A. N. Belozerkiy, Biological Faculty, Chair of Biophysics, Moscow State University; \*Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

UDC 577.352.4

[Abstract] Studies were conducted on the mechanisms underlying nonspecific permeability of hepatic mitochondrial inner membranes isolated from rats, involving an analysis of the effects of various antioxidants on

induction of permeability by hydroperoxides. Comparative analysis of the effects of strong (4-methyl-2,6-di-tert-butylphenol, tert-butyl-4-methoxyphenol, 2,2,5,7,8-pentamethyl-6-hydroxychroman) and weak (propyl gallate) antioxidants showed that they differed in their efficacy in limiting  $\text{Ca}^{2+}$ - and cumene hydroperoxide-induced rise in permeability of the inner membrane of mitochondria. The stronger inhibition of permeability obtained with the more powerful antioxidants implicated that free radical processes in the increase in permeability, and also demonstrated that cumene hydroperoxide and  $\text{Ca}^{2+}$  act as synergists. Accordingly, by limiting lipid peroxidation and damage to the inner membranes the antioxidants counteract the effects of  $\text{Ca}^{2+}$  and cumene hydroperoxide. Figures 7; references 41: 2 Russian, 39 Western.

**Inhibition and Stimulaton of ATP Synthesis in Hepatic Mitochondria by UV Light-Mediated Superoxide Generation**

917C0278C Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 7 No 9, Sep 90 (manuscript received 23 Nov 89) pp 961-965

[Article by L. F. Dmitriyev, M. V. Ivanova and I. I. Ivanov, Biological Faculty, Moscow State University]

UDC 577.352.38

[Abstract] Mitochondria isolated from rat livers were used in a study designed to assess the effect of superoxide on ATP synthesis, employing UV irradiation to generate  $\text{O}_2^-$ . The results demonstrated that the rate of ATP synthesis was decreased in excess of superoxide or a deficit of unsaturated fatty acid radicals resulting from addition of the antioxidant propyl gallate. The data were interpreted to indicate that a threshold concentration of lipid radicals resulting from lipid peroxidation was required for ATP synthesis, and that such radicals serve to couple electron transport with ATP synthesis. Figures 4; references 13: 4 Russian, 9 Western.

**Transmembrane Potential Effect in Light-Mediated Charge Separation in Liposomes**

917C0278D Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 7 No 9, Sep 90 (manuscript received 21 Mar 90) pp 966-977

[Article by A. I. Lavrentyev, V. A. Nadtochenko, I. V. Rubtsov, N. N. Denisov, Ya. V. Barannikova\* and V. V. Nikandrov\*, Institute of Chemical Physics Branch, Chernogolovka, Moscow Oblast, and the Institute of Biochemistry imeni A. N. Bakh, Moscow, USSR Academy of Sciences]

UDC 577.34

[Abstract] In order to design more efficient artificial photosynthetic systems a detailed analysis was conducted on the action of transmembrane potentials on

light-induced charge separation in liposomes. The experiments were conducted with hydrophilic pigments, serving as electron acceptors, incorporated into liposomal membrane and internalized hydrophilic electron donors, employing several donor-acceptor combinations. The data led to the formulation of a kinetic model of ion-radical recombinations within liposomes, which demonstrated that the transmembrane potential, depending on its sign, may either increase or decrease light-induced charge separation in liposomal membranes. This phenomenon is affected by the effect exerted by the electric field on the radial drift rate of hydrophobic radicals at the membrane boundary. The increase in the quantum yield of transmembrane light-induced electron translocation is attributable to enhanced rate of electron migration across the carbohydrate component. The latter facilitated by a decrease in the energy barrier of the membrane and reduced probability of competitive reverse recombination of the ion-radicals. Figures 6; tables 1; references 28: 9 Russian, 19 Western.

#### Mechanism of Action of Oxaphospholanol-Based Ion Channel Blockers in Cholireceptors

917C0278E Moscow BIOLOGICHESKIYE  
MEMBRANY in Russian Vol 7 No 9, Sep 90  
(manuscript received 15 Nov 88) pp 1001-1007

[Article by R. N. Khazipov, Kh. S. Khamitov, R. A. Ganiatullin and R. S. Garayev, Kazan Medical Institute imeni S. V. Kurashov]

UDC 577.25

[Abstract] Voltage clamp studies were conducted on endplate currents of frog sartorius muscles to assess the relationship between blocking kinetics and hydrophobicity of oxaphospholanol congeners vis-a-vis nicotinic cholireceptor ion channels. Studies with neutral oxaphospholanol congeners differing in the number of side chain methylene groups at 20°C and a fixed membrane potential of -70 mV showed that the kinetics were directly related to hydrophobicity. The most hydrophilic derivative with a single -CH<sub>3</sub> side group was the most rapid raid blocker. Conversely, the most hydrophobic congener with the -(CH<sub>2</sub>)<sub>4</sub>CH<sub>3</sub> side group was also the slowest. Derivatives with an intermediate number of methylene groups and, therefore, of intermediate hydrophobicity, yielded intermediate blocking kinetics. The kinetics were consistent with a model in which affinity increased in direct proportion to the length of the side chain. The data were consistent with binding of the hydrophobic side chains to lipid components at the receptor-membrane interface, with binding affinity increasing in proportion to the size of the side chain. Figures 5; tables 1; references 27: 9 Russian, 18 Western.

**Treatment of Respiratory Infections in Calves  
With T-Activin and Protargol**

*917C0385A Moscow VETERINARIYA in Russian  
No 11, Nov 90 pp 22-23*

[Article by P. A. Krasochko and T. I. Pomirko, Moldavian Scientific Research Institute of Animal Husbandry and Veterinary Sciences, and P. I. Yarovoy, Moldavian Scientific Research Institute of Preventive and Clinical Medicine]

UDC 619:616.9-085.37

[Abstract] Therapeutic trials were conducted on two groups of calves with respiratory infection, with the control group (44 animals) managed conventionally with streptomycin. The experimental group (44) was treated with a combination of T-activin (40 µg, 3 times over 3 days + 2 times after 7 days) and protargol (intratracheal lavage with 10 ml of 0.4 percent solution q. 7 days for 1 month). Within five days of treatment the number of sick animals in the experimental groups was reduced to 11, and all were cured by day 30. In the control group four calves were still symptomatic on day 30. In the experimental group the T-cell counts increased 2.5-fold by day 21 and B-cell counts 1.3- to 1.5-fold. In addition, the average weight gain per day in the experimental groups was 575 g versus 533 g in the control animals. Accordingly, these findings demonstrated the efficacy of

T-activin + protargol combination in the management of respiratory infections in calves. Tables 1.

**Major Factors in Foot-and-Mouth Disease (FMD)  
Epizootiology**

*917C0385B Moscow VETERINARIYA in Russian  
No 11, Nov 90 pp 24-26*

[Article by B. A. Kruglikov, V. A. Sedov and T. Ya. Tartasenko]

UDC 619:616.988.43

[Abstract] The three major factors underlying FMD epizootiology are presence and virulence of the pathogen, its routes of transmission, and host susceptibility. Complicating factors are represented by the extreme contagiousness and resistance of the virus to inactivation, as well as density of susceptible host and territorial contamination by migration patterns of wild animals. In addition, in Central Asia and Transcaucasus seasonal drives of domestic animals to summer grazing lands and back to wintering pens may also serve to contaminate additional regions. Finally, in an epizootic situation the more virulent biotypes of the virus tend to become dominant, and in one case virulence has been found to increase by more than 3 log LD<sub>50</sub>/ml units. Accordingly, the more effective measures have consisted of slaughter of infected animals, quarantine and vaccination.

**Development of Expression Integrative Vector and Its Use in Incorporating Human Recombinant Alpha-Interferon Gene Into Plants**

917C0265A Moscow *GENETIKA* in Russian Vol 26 No 12, Dec 90 (manuscript received 17 Jul 90) pp 2111-2121

[Article by S. P. Smirnov, E. Kh. Teverovskaya, L. V. Krasheninnikova, and V. A. Pukhalskiy, General Genetics Institute imeni N. I. Vavilova, USSR Academy of Sciences, Moscow]

UDC 575.11

[Abstract] The pST6 expression vector is a wide range universal plant vector used for cloning various genes under the control of a strong constitutive promoter. In this case, the 35S promoter from the cauliflower mosaic virus was selected for use in the expression cassette and as a selective marker for kanamycin resistance, which would permit direct selection of transgenic plants. In this study the pST6 vector was used for inserting the recombinant human  $\alpha$ -interferon gene into the tobacco plant genome and insuring its expression in plant cells. Techniques that did not upset the integrity of the gene coding section were used to clone the IFLrA gene into the plasmid vector. The authors also ensured that no other ATG codons were located between the 35S promoter and the IFLrA gene initiating codon so that there would be the correct frame for the translation and synthesis of protein immunologically similar to human leukocytic interferon in the transgenic plants. The results demonstrated that kanamycin resistant regenerant tobacco

plants of the sort Samsun and Ternovskiy hybrid that bear the human interferon gene were produced. In addition, analysis of the plants indicated normal expression of the human interferon gene that was incorporated into the plant genome, though interferon synthesis in the transgenic plants diminished after some time. In conclusion, these results demonstrate that the pST6 vector is suitable for use in the incorporation and expression of foreign genes in plant cells. Figures 6; references 16: 3 Russian, 13 Western.

**Mechanism of Action of Catecholamines in Bovine Lactation**

917C0390A Moscow *SELSKOKHOZYAYSTVENNAYA BIOLOGIYA* in Russian No 6, Nov-Dec 90 (manuscript received 15 Mar 89) pp 79-83

[Article by A. G. Markov and G. Milke, Physiological Institute, Leningrad State University; K. Marx Leipzig University, GDR]

UDC 636.2:591.146

[Abstract] An analysis was conducted on the peripheral mechanism of catecholamine action in bovine lactation via an evaluation of the effects of isoproterenol, a  $\beta$ -adrenergic agonist. Studies on two 3-year-old 'black striped' cows with empty udders demonstrated that administration of 1  $\mu$ g/kg of isoproterenol into the jugular vein induces lactation with a latent period of 40-100 sec. The effects of isoproterenol were attributed to contraction of alveolar myoepithelial cells. Figures 1; tables 1; references 8: 4 Russian, 4 Western.

**Soviet-Indian Experiment in Adaptation to Cold Climates**

917C0348A Moscow *PRAVDA* in Russian 22 Feb 91  
2nd p 6

[Article by A. Khramtsov (Pravda Non-Staff Correspondent), Murmansk, under the title "Trial by the North"]

[Text] The results of a joint experiment of medical researchers of the USSR Ministry of Health and the Ministry of Defense of India which has been concluded in the Khibiny Mountains are of great interest. It was carried out for the purpose of studying the biological, physiological, and pathological aspects of the acclimatization of inhabitants of regions with hot climates in the severe regions of the Far North.

**The Experiment**

Twenty-two volunteers, including 10 soldiers of the Indian Army and 22 Soviet civilians, were the subjects of a survival study. Having settled at one of the hiking bases not far from the city of Kirovsk, they lived for ten weeks in the mountains. The scientists carried out observations of their biorhythms, their physical and intellectual capacity for work, and the condition of their sleep.

The experiment envisaged the study of the influence of yoga exercises, exercises on bicycle ergometers, submergence of the hands into ice water, and diet on the acclimatization of individuals. The Indian physicians attribute great significance to the latter. As Dr. Padma stated, the administration of vitamin C with fresh vegetables and fruits to the human organism allows it to overcome supercooling more easily.

As to why the Ministry of Defense and not the Ministry of Health of her country had become a participant in the joint Soviet-Indian experiment, Dr. Padma answered:

—First, the military department has excellent specialists in the field of medicine at its disposal, and second, it

is interested to see that a soldier summoned from the southern humid region of India, for example, to the cold Himalayas does not experience discomforts from an unaccustomed climate.

The director of the Kirovsk branch of the Scientific Production Association of Hygiene and Occupational Pathology, V. Chashchin stated:

—The conclusions of the medical researchers will help in the development of scientifically well-founded recommendations for the prevention of the diseases of citizens of the North which are associated with living in extreme natural conditions.

**Accelerated Adaptation to High Climates and Physical Performance of Military Personnel**

917C0383B Moscow *VOYENNO-MEDITSINSKIY ZHURNAL* in Russian No 11, Nov 90 pp 48-51

[Article by V. P. Kovalenko, doct. med. sci., col., Med. Corps, and A. S. Andronov, col., Med. Corps.]

UDC 355.22:613.646

[Abstract] Trials were conducted on accelerated adaptation to hot climates and the results assessed in a step-test ( $PWC_{170}$ ; W/kg) in the case of 100 soldiers, half of whom came from Central Asia and half from central Russia. The soldiers underwent a seven day adaptation involving physical exercises from 0900 to 1100 hours with air temperatures ranging from 29 to 37°C. Medical monitoring and the results of the step-test after adaptation showed 33.8 percent improvement in  $PWC_{170}$  dynamics of the Central Asian soldiers and a 39.4 percent improvement in the soldiers from central Russian. Thus, soldiers from hot and cold climates benefitted to an equivalent extent from short-term adaptation in terms of physical performance, along with more efficient regulation of body temperature. Tables 3.

**Effects of Antistatic Surfactants on Immune Indicators**

*917C0301B Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 12, Dec 90 (manuscript received 19 Mar 90) pp 14-16*

[Article by K. U. Kasenov, S. T. Shumbalova, S. Zh. Musabayeva and Zh. S. Sundetov, Medical Institute, Aktyubinsk]

UDC 613.632.3:661.185]-092:612.017.1]092.9

[Abstract] An analysis was conducted on the adjuvant effects of two surfactants—OS-20 (hydroxyethylated higher fatty alcohols) and stearoks-920 (hydroxyethylated fatty acids)—in outbred rats. The antibody response to subcutaneous (s.c.) immunization of 200–210 g rats with either staphylococcal toxoid or heat-killed *E. coli* vaccine was significantly enhanced ( $P < 0.001$  to  $p < 0.05$ ) in animals concomitantly treated s.c. at another site with either 0.05 ml or 0.1 ml/100 g of 1.5 percent OS-20 or stearoks-920. However, stearoks-920 was shown to be a more potent adjuvant than OS-20. In a related study both s.c. administration and topical application of these surfactants enhanced elimination of *E. coli* from the skin of treated rats. Tables 1; references 6: Russian.

**Effects of B-Helpers and Age of Thymocyte Donors on Macrophage-Dependent T-Cell Inactivation of Allogeneic Stem Cells**

*917C0345A Moscow IMMUNOLOGIYA in Russian No 5, Sep-Oct 90 (manuscript received 11 Sep 89) pp 18-22*

[Article by V. M. Manko, T. B. Rudneva, O. L. Blagonravova, Ye. Yu. Osipova and V. M. Zemskov, Institute of Immunology, USSR Ministry of Health, Moscow]

UDC 612.112.94.017.1

[Abstract] Cell transfer studies were conducted to assess the regulatory mechanisms involved in T-cell inactivation of allogeneic hemopoietic stem cells. The results were evaluated in terms of splenic colony formation in lethally gamma irradiated (8.5 Gy) adult female (CBA x C57BL/6J)F<sub>1</sub> mice following combined injection of thymocytes and macrophages from CBA mice and bone marrow cells from adult female C57BL/6J mice. Thymic effects were assessed using intact and thymectomized CBA donors ranging in age from three days to 12 weeks. The highest degree of stem cell inhibition was obtained when thymocytes were incubated with macrophages and B-cells, with the thymocyte plus macrophage combination shown to be less effective. Incubation of B-cells with either thymocytes or macrophages did not lead to inactivation of the stem cells, indicating that B-cells facilitated thymocyte-macrophage interaction. Maximum activity was shown by thymocytes from 4- to 5-week-old CBA mice. Thymocytes from mice less than a week old

or older than eight weeks were ineffective due to, presumably, immaturity and involution of the thymus. Figures 1; tables 4; references 5: Russian.

**Thymic Effects on Interferon (IF) Induced T-Cell Production of Macrophage Activating Factor (MAF) in Mice**

*917C0345B Moscow IMMUNOLOGIYA in Russian No 5, Sep-Oct 90 (manuscript received 1 Mar 90) pp 26-29*

[Article by F. V. Filchakov, I. V. Filchakov, L. A. Ganova, N. Ya. Spivak, N. I. Grabchenko, V. K. Ivanenko and Ye. I. Protsap, Institute of Microbiology and Virology imeni D. K. Zabolotnyy, Ukrainian SSR Academy of Sciences, Kiev]

UDC 616.155.33-02:615.339:578.245]-07:616.438-008.6

[Abstract] Studies were designed to determine the role of thymus in T-cell activation of peritoneal macrophages using type-I IF-treated CBA mice. Incubation of macrophages with splenic or lymph node cells showed activation of the macrophages NBT tests and phagocytosis of *Staphylococcus aureus*. Splenic and lymph node cells were shown to be equally effective, and most studies were done with the former. Cells from thymectomized mice were ineffective, although activation was reinstated when the thymectomized mice were pretreated with thymalin or transplanted with syngeneic thymus in a diffusion chamber. Consequently, these observations demonstrated that thymic factors control IF-induced synthesis of MAF by T-cells. Figures 4; references 15: 12 Russian, 3 Western.

**Rat Monoclonal Antibodies (MA) Against Surface Antigens of Mouse Splenocytes: Detection of Forssman Antigen on Splenic Macrophages**

*917C0345C Moscow IMMUNOLOGIYA in Russian No 5, Sep-Oct 90 (manuscript received 17 May 89) pp 29-32*

[Article by N. N. Logunova and Ye. V. Sidorova, Scientific Research Institute of Viral Preparations, USSR Academy of Medical Sciences, Moscow]

UDC 612.411.017.1]019.083.3

[Abstract] MAs against mouse macrophages were derived by immunization of August rats with splenic blast cells of BALB/c mice that had been immunized with *E. coli* LPS. Subsequently, August splenic cells were fused with myeloma X.63.Ag8.653 cells using polyethylene glycol, yielding several clones of cells producing IgG and IgM MAs reacting equally well with splenic macrophages of BALB/c, CBA and C57BL/6 mice. The MAs failed to react with peritoneal macrophages, which was attributed to expression of Forssman antigen on the splenic cells and not on the peritoneal cells. Activation of peritoneal macrophages led to expression of surface Forssman antigens and reactivity with the MAs, and in

vitro cultivation of the splenic macrophages resulted in disappearance of the Forssman antigen and loss of reactivity. Cultivation of splenic macrophages in the presence of ConA favored retention of Forssman antigen. Accordingly, expression of the Forssman antigen on the surface of macrophages is related to activation. Figures 2; references 17: 3 Russian, 14 Western.

#### Free Radical Oxidation of Membrane Lipids of Lymphocytes in Relation to Immunodeficiency and Correction With A-Tocopherol

917C0345D Moscow IMMUNOLOGIYA in Russian  
No 5, Sep-Oct 90 (manuscript received 22 Nov 89)  
pp 33-35

[Article by G. B. Afonina and V. G. Bordonos, Kiev Medical Institute]

UDC 616.155.32-008.939.15-092:612.017.1]-  
085.356:577.161.3

[Abstract] Outbred rats were employed in analysis of the lipid peroxidation as it affects lymphocyte surface and transient immunodeficiency induced by intraperitoneal infection with *Staphylococcus aureus* 75 and immunization with SRBC. On balance, in both cases the results demonstrated that early transient immunodeficiency was accompanied by diminished expression of surface receptors on splenic lymphocytes. These changes were related to activation of free radical peroxidation of membrane phospholipids of lymphocytes and inhibition of antioxidant mechanisms. Manifestation of immunodeficiency included reduction in T<sub>H</sub> and E rosette-forming cells, with eventual raise in T<sub>B</sub> cells. Intraperitoneal treatment of the rats with 0.5 mg/kg  $\alpha$ -tocopherol within 1-4 days of infection overcame these changes. The mechanism of action of  $\alpha$ -tocopherol was evidently due to attenuation of lipid peroxidation on lymphocyte surface. Tables 1; references 11: 7 Russian, 4 Western.

#### Antigen Nonspecific T-Suppression in Experimental Influenza and Immobilization

917C0345E Moscow IMMUNOLOGIYA in Russian  
No 5, Sep-Oct 90 (manuscript received 12 Feb 90)  
pp 35-38

[Article by I. Yu. Kildivatov, B. A. Frolov, M. S. Blyakher, L. K. Chetverikov, V. K. Filippov, T. A. Kramskaya and R. Ya. Polyak, Orenburg Medical Institute; Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

UDC 616.98:578.832.1]-02:613.863]-092:612.017.1]-  
078.33

[Abstract] Experimental influenza infection was combined with pre-infection immobilization to assess the impact on antigen-nonspecific T-cell suppression in (CBA x C57BL)F<sub>1</sub> mice. The results were analyzed in

terms of the ability of splenic cells to inhibit antibody-forming cells in syngeneic splenic cells primed with SRBC on joint culture. The results demonstrated that both lethal (5.5 log EID<sub>50</sub>) and nonlethal (3.5 log EID<sub>50</sub>) infections result in antigen-nonspecific suppression. Interestingly, pre-infection stress with a 6 h immobilization period 1 h before infection did not exacerbate the suppressive mechanism. In fact, depending on the virus dose, suppression was abrogated or attenuated. The effects of immobilization were attributed to neurohumoral mechanisms, including activation of the pituitary-adrenocortical axis. Figures 2; tables 1; references 15: 11 Russian, 4 Western.

#### Clinical Immunological Monitoring of Workers at Chemical Plants

917C0345F Moscow IMMUNOLOGIYA in Russian  
No 5, Sep-Oct 90 (manuscript received 27 Nov 89)  
pp 38-41

[Article by M. Z. Saidov, I. V. Oradovskaya, A. I. Martynov, B. G. Skuybin, O. F. Yeremina, A. V. Simonova, O. M. Kotova, A. V. Kulakov and N. M. Golubeva, Institute of Immunology, USSR Ministry of Health, Moscow]

UDC 712.07.1.06:[613.632:632.934.3]

[Abstract] Immunological monitoring was performed on 176 workers at the Shchelkovo chemical plant which specializes in production and testing chemical agents for plant protection. Monitoring was conducted in conjunction with other objective and subjective health evaluations, and led to the conclusion that workers involved in the production and testing of organochlorine and organophosphorus compounds are at a health risk. The immunological studies revealed significant depression of IgG levels and T-cells in E-rosette formation tests, a high incidence of spontaneous blast transformations, and diminished responsiveness to PHA due to serum blocking factors. Other findings included significant depression of CD3<sup>+</sup> and CD4<sup>+</sup> T-cells. The incidence of these deviations varied among the different production facilities, but indicated that on an overall basis health was compromised as a result of occupational exposure to chemicals used in crop protection. Tables 4; references 10: 8 Russian, 2 Western.

#### Immunomodulating Action of Imidazole-Containing Polyelectrolytes

917C0345G Moscow IMMUNOLOGIYA in Russian  
No 5, Sep-Oct 90 (manuscript received 8 Dec 89)  
pp 63-66

[Article by V. M. Manko, T. B. Rudneva, R. I. Gadzhiev, Ye. A. Sokolova and M. I. Mustafayev, Institute of Immunology, USSR Ministry of Health, Moscow]

UDC 615.371.038.07

[Abstract] Poly-N-vinylimidazole (PNVP) polyelectrolytes were tested for their actions on antibody response and T- and B-cell cooperation. The results showed that

simultaneous immunization with SRBC and i.p. administration of 0.001 mg of PNVP:Cu complex suppressed antibody synthesis, whereas 1 mg of the complex enhanced the antibody response. Analogous experiments with PNVP alkylated with cetyl bromide showed enhanced antibody response with a dose of 0.1 mg and an inhibitory effect with 1 mg. Further, in enhancing concentrations the PNVP agents facilitated T- and B-cell

cooperation while in antibody inhibitory concentrations the opposite prevailed. In the final analysis, the actions of the PNVP agents were attributed to their effects on cell proliferation. In stimulating concentrations these agents induced a 1.3- to 1.4-fold increase in splenic cellularity, and in inhibitory concentrations a 2-fold reduction in cell counts four days after immunization. Figures 2; tables 4; references 5: 3 Russian, 2 Western.

### Immunomodulation With Vitamin E in Open Heart Surgery

917C0310A Moscow GRUDNAYA I SERDECHNO-SOSUDISTAYA KHIRURGIYA in Russian No 12, Dec 90 (manuscript received 20 Apr 90) pp 30-33

[Article by O. S. Gaydova, A. V. Lobkov and A. A. Lubyako, Leningrad Scientific Research Institute of Cardiology, RSFSR Ministry of Health]

UDC 616.12-089.66:616.12-78/-06:616.127-008.922.1-084:[615.356:577.161.3]-089.168-092:612.017.1]-07

[Abstract] Therapeutic trials were conducted with vitamin E administration (40 mg/kg) to ten patients 3.5 h before institution of extracorporeal circulation in open heart surgery. Comparative data were obtained for 11 patients who were not treated with vitamin E. The immune status of the patients was monitored for 21 days postoperatively. The results showed that preoperative vitamin E alleviated the immunosuppressive sequelae of extracorporeal circulation, acting largely on cellular immunity (improved phagocytosis, attenuated leukocytosis, enhanced blast transformation in response to mitogen). The clinical observations indicated that preoperative vitamin E is indicated in cases requiring extracorporeal circulation in order to mitigate cellular immunosuppression. Figures 2; references 15: 11 Russian, 4 Western.

### Transcranial Electrostimulation in the Treatment of Neurosensory Hearing Loss

917C0562 Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian No 1, Jan-Feb 91 (manuscript received 23 Jul 90) pp 31-36

[Article by A. S. Rozenblyum, V. P. Lebedev, N. I. Krayeva, and Ye. M. Tsirulnikov, Department of Physiology and Pathology of Hearing, Leningrad Ear, Nose, Throat, and Speech Scientific Research Institute]

UDC 616.28-009-08:615.83

[Abstract] A number of researchers have derived data on the stimulating effect of peptides on processes involving the regeneration of the peripheral nervous system and the central nervous system, and those data have served as the basis for attempts to use peptides in individuals suffering from neurosensory hearing loss. After witnessing dalargin's positive effect in such individuals, the researchers here were prompted to examine the possibility of producing a similar effect via stimulation of the formation of endogenous neuropeptides with transcranial electroanalgesia. The technique used by the researchers consisted of using a modified Elektronarkon-1 unit to send both a DC current and an AC current simultaneously through the skin covering the cranium, via frontal and retromastoidal electrodes. The electrostimulation conditions were based on previous experimental research that was performed at the Pavlov Institute of Physiology and is patented (No 1074543). The course of treatment included 7-10 procedures performed daily or every other day, each lasting 30 minutes. A total of 84 individuals underwent the procedures. History of hearing loss ranged from five years to 15, with recent, sudden hearing loss reported in 22 individuals. All the individuals reported improved hearing after electrostimulation, although tonal audiograms failed to verify that in some cases. Improved hearing was identified in 18 of the 22 individuals with recent hearing loss (in three individuals, the improvement was noted at certain frequencies only). The most effective treatment appeared to be in those who continued the treatment for at least 10 days. In another group of patients (62 individuals with chronic hearing loss), 45 percent demonstrated improved hearing; 39 percent, no change; and 3 percent, deterioration at certain frequencies. The remaining 13 percent demonstrated what was called a "subjective" improvement in the intelligibility of their speech, since threshold tonal audiometry did not confirm hearing improvement. In the individuals with sudden hearing loss and in one-third of the chronic hearing-loss patients, the improvements noted by the researchers lasted over a four-year observation period. Overall, the researchers conclude that the improvements due to electrostimulation come quicker and more often than do improvements due to medications or physiotherapy. Figures 4; references 13: 12 Russian, 1 Western.

**Pay Benefits for Military Personnel Exposed to Electromagnetic Fields**

917C0348D Moscow KOMMUNIST  
VOORUZHENNYKH SIL in Russian No 23, Dec 90  
p 55

[Article under the title "Is the Electromagnetic Field Harmful?"]

[Text] "It was discovered not long ago that symptoms which are undesirable in relation to health have been appearing in people who have been exposed, through their working conditions, to electromagnetic fields. These include increased fatigue, headache, extreme irritability, somnolence, dizziness, decreased attention and poor memory. We would like to find out what kinds of benefits service personnel who have been associated with such technology have at their disposal. What types of preventive measures should be taken to reduce the harmful effects of electromagnetic fields.

"Officers O. Shchelkovich, A. Grexov"

Servicepersons V. Kalchenko, S. Velikorodniy, and A. Ivanov have also addressed similar questions to the editors.

We turned to specialists of the Central Military Medical Administration of the USSR Ministry of Defense for clarification. We were informed that irreversible changes

can arise in the organism with exposure to electromagnetic energy in the decimeter and centimeter ranges at levels higher than the maximum permissible levels. Their severity depends on the magnitude of the flux density of the energy of the electromagnetic field, as well as on the individual characteristics of the organism. In particular, the sick, children, and elderly persons are more sensitive to the influence of electromagnetic fields (EMF).

The prevention of the harmful effects of electromagnetic energy on the organism is achieved by the design of generating apparatus which leads to the exclusion or the reduction of the penetration of worksites by the electromagnetic field, as well as by the carrying out of measures for the safety of operations, measures stipulated by sanitary norms and the rules for protection against the effects of electromagnetic fields.

Additional remuneration for the work of blue and white collar workers of the Soviet Army who have been exposed to electromagnetic fields has been defined by the relevant order of the USSR Ministry of Defense of 1987.

With regard to the extension to military personnel of benefits enjoyed by civilian specialists, the resolution of this question will only be possible after the new Statute on the Military Service of the Officer Corps of the Armed Forces of the USSR takes effect.

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**Gas Chromatographic Analysis of Worksite Air Levels of 2-Bromo-6-Cloro-4-Nitroaniline (I), N,N-Dioxyethyl-m-Chloroaniline (II), N-Hydroxyethyl-N,B-Cyanoethylaniline (III) and N-Ethyl-N,B-Cyanoethyl-m-Toluidine (IV)**

917C0301C Moscow *GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA* in Russian No 12, Dec 90 (manuscript received 28 Feb 90) pp 44-46

[Article by D. A. Telichko, Ye. G. Ivanyuk and V. V. Vasilenko, Institute of Industrial Hygiene and Occupational Diseases, Kharkov]

UDC 613.632.4:547.551.1]:074:543.544

[Abstract] Gas chromatographic analysis of compounds I, II, III and IV resulted in the identification of columns packed with N-AW-DMCS and 5 percent XE-60 as being optimum for I, II and III, whereas IV required N-AW-DMCS with 5 percent SE-30. In combination with a flame-ionization detector, the technique was found suitable for analysis of air samples at worksites since it allowed determination of these chemicals at the 0.5 TLV level. Figures 1; tables 1; references 3: Russian.

**Effects of Fraction 5 Thymosin (F5T) and F5T Synthetic Component Thymosin- $\alpha_1$  ( $\text{Ta}_1$ ) on Rat Behavior in Open Field Trials**

917C0363A Moscow *FARMAKOLOGIYA I TOKSIKOLOGIYA* in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 12 Aug 89) pp 15-17

[Article by A. M. Boldyrev, I. Yu. Orbachevskaya and S. S. Mitrokhina, Scientific Research Laboratory of Biologically Active Substances of Hydrobionts, USSR Ministry of Health, Moscow]

UDC 615.272.4.015.4.076.9

[Abstract] Open field trial studies were conducted with 170-200 g female and 350-400 g male Wistar rats to assess the behavioral effects of F5T and  $\text{Ta}_1$ . F5T was isolated from the thymus of the Greenland seal (*Pagophilus groenlandica*). This fraction consists of some 30 peptides, one of which is represented by  $\text{Ta}_1$ . The results showed injection of 10 ng of F5T or of synthetic  $\text{Ta}_1$  in a lateral cerebral ventricle led to inhibition of motor activity for ca. 0.5 h. Intraperitoneal injection of F5T in doses of 0.15, 0.30 and 0.60 mg/kg resulted in dose-dependent depression of motor activity for > 2 h. Accordingly, the data were interpreted to indicate that in addition to immunomodulating actions, both F5T and its  $\text{Ta}_1$  component evidence neurotransmitter-like effects. Figures 2; references 9: 6 Russian, 3 Western.

**Pain Relief With Narcotic Analgesics and Klofelin After Ionizing Irradiation of Rats**

917C0363B Moscow *FARMAKOLOGIYA I TOKSIKOLOGIYA* in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 19 Jul 89) pp 17-19

[Article by Yu. D. Ignatov, A. A. Zaytsev and A. A. Abdurakhmanov, Chair of Pharmacology, 1st Leningrad Medical Institute imeni I. P. Pavlov; Institute of Nuclear Physics, Kazakh SSR Academy of Sciences]

UDC 615.212.5.015.2:615.849.1].015.4.076.9

[Abstract] In order to assess the putative mechanism of action of ionizing radiation on pain perception, an analysis was conducted on the interaction of radiation and analgesic agents. The experimental model was provided by outbred rats subjected to 150 Gy gamma irradiation, and the results assessed in tail-flick test after a thermal stimulus and vocalization after application of an electric shock to the tail. The results showed that irradiation increased the latent period for a tail-flick and diminished the efficacy of morphine (5 mg/kg; i.p.), trimeperidine (3 mg/kg; i.p.) and fentanyl (0.03 mg/kg; i.p.). However, the analgesic potency of klofelin (1 mg/kg; i.p.) was enhanced. Ionizing radiation also reduced the pain threshold for vocalization without affecting the action of fentanyl and trimeperidine, but diminishing the efficacy of morphine and klofelin. Naloxone (0.1 mg/kg; i.p.) was shown to abolish post-radiation analgesia in the tail-flick test, and in doses of 0.1 and 1 mg/kg was without effect on the hyperalgesic effect as observed in the vocalization test. Accordingly, the effects of ionizing radiation on nociception are due to effects on binding of endogenous opioids to  $\mu$  receptors. Figures 1; tables 1; references 8: 3 Russian, 5 Western.

**Antiarrhythmic Actions of Piracetam**

917C0363C Moscow *FARMAKOLOGIYA I TOKSIKOLOGIYA* in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 12 May 89) pp 22-23

[Article by V. M. Samvelyan, M. G. Malakyan and S. A. Badzhinyan, Laboratory of Pharmacology and Pathophysiology, Scientific Research Institute of Cardiology, Armenian SSR Ministry of Health, Yerevan; Biomembrane Laboratory, Scientific Research Institute of Medical Radiology, Armenian SSR Ministry of Health, Yerevan]

UDC 615.214.3:547.745].017:615.22

[Abstract] Outbred rats were employed in an assessment of the antiarrhythmic mechanism of action of piracetam. The results demonstrated that piracetam (100-400 mg/kg; i.v.) was most efficacious against calcium chloride-induced arrhythmia, less so against the strophanthin model, and without effect in aconitine. Piracetam also elevated the threshold for electrically induced atrial fibrillation and acted as a cardiotonic; in some cases a

re-established sinus rhythm was followed by bradycardia. Concomitantly, red cell membrane potential was reduced to -9mV, as was the case with lidocaine. However, unlike lidocaine, piracetam did not induce an increase in passive potassium transport. Studies on bilayer lipid membranes indicated that antioxidant action of piracetam was not a factor in its antiarrhythmic effects, rather its efficacy was due to metabolic stimulation and enhancement of coronary blood flow. Tables 2; references 16: 12 Russian, 4 Western.

#### **Pharmacokinetic and Immunopharmacologic Aspects of Prodigiozan-Psychotropic Agent Interactions**

*917C0363D Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 17 Aug 89) pp 36-39*

[Article by S. V. Sibiryak and Ye. K. Alekhin, No. 1 Chair of Pharmacology, Bashkir Medical Institute, Ufa]

UDC 615.276.4.015.2:615.214].015.46:612.017.1

[Abstract] Outbred 16-18 g male mice were used in assessing the interaction of prodigiozan with psychotropic agents, in view of the inhibitory effects that prodigiozan has on hepatic P-450-dependent monooxygenases. Administration of prodigiozan (0.5 mg/kg/day; 3 times) was shown to diminish chlorpromazine toxicity by raising the LD<sub>50</sub> dose from 95 to 172 mg/kg; haloperidol toxicity was not affected. Further, in tail hanging tests the actions of both psychotropic agents were prolonged by prodigiozan. Studies on intraperitoneal infections with *Pseudomonas aeruginosa* showed that prodigiozan stimulated immunity, and that its immunostimulant potential was not affected by chlorpromazine or haloperidol. Figures 2; tables 2; references 14: 8 Russian, 6 Western.

#### **Interaction of Catecholaminergics and Immunostimulants**

*917C0363E Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 12 May 89) pp 33-36*

[Article by N. I. Shigayev and D. N. Lazareva, No. 1 Chair of Pharmacology, Bashkir Medical Institute, Ufa]

UDC 615.275.4.015.2:615.252.452

[Abstract] An analysis was conducted on the interaction of immunostimulants (levamisole, prodigiozan, methyuracil) and catecholaminergic agents (haloperidol, norepinephrine, phenotolamine), using as a model system male and female outbred mice infected with *Proteus mirabilis*. Preinfection administration of the catecholaminergics was shown to significantly increase the survival rate and longevity of infected mice. In combination

with immunostimulants the outcome of infection was variable, and basically demonstrated antagonism between  $\alpha$ -adrenergic and dopamine receptors in infections. The interaction of both classes of compounds had variable effects, depending on administration schedules. However, when given after the antigen dopamine enhanced the antibody response while haloperidol depressed it, and adrenergic agents had no effect. Figures 1; tables 1; references 18: 12 Russian, 6 Western.

#### **Correction of Vibration-Induced Immunosuppression by Plant Heteropolysaccharides**

*917C0363F Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 28 Jul 89) pp 43-46*

[Article by Ye. A. Yakovleva, A. I. Yakovlev and L. G. Prokopenko, Chair of Biochemistry, Kursk Medical Institute]

UDC 616-057-02:613.644]-085.32:547.458]-036.8-07-092.9

[Abstract] Experimental therapeutic trials were conducted with a heteropolysaccharide (FPS) isolated from thistle (Asteraceae) in a model of vibration-induced immunosuppression. The results showed a reduction in the antibody response to SRBCs and LPS derived from *Salmonella typhi* in 130-150 g Wistar rats subjected to 50 Hz vertical vibrations with an amplitude of 0.5 mm (1-7 h and/or 3 h per day for 7-10 days). Treatment of the animals with HPS (50 mg/100 g, 5 times q. 24 h; intragastrically) at the time of immunization was effective in reversing the effects of short-term vibration in the case of SRBCs. HPS was ineffective following prolonged vibration and in the case of LPS. These observations indicate that immunostimulatory action of HPS was mediated via splenic T-cells prior to the onset of vibration pathology. Figures 1; tables 2; references 10: 9 Russian, 1 Western.

#### **Action of Triamcinolone Acetonide (TA) on Hepatic Mitochondria in Endotoxemia**

*917C0363G Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 53 No 6, Nov-Dec 90 (manuscript received 1 Aug 89) pp 54-55*

[Article by L. V. Natanzon and A. I. Arkhipova, Central Scientific Research Laboratory and Chair of Biochemistry, Volgograd Medical Institute]

UDC 616.36-018.1:576.311.347]-02:615.919:579.842.14-02:615.2.2015.2

[Abstract] Efficacy of TA in hepatic protection was assessed on outbred albino mice challenged intraperitoneally with 5 mg/kg (LD<sub>50</sub>) of endotoxin isolated from *Salmonella typhimurium* 79. Monitoring of hepatic

mitochondria showed that within 9 h of endotoxininjection monoamine oxidase, succinate dehydrogenase, glutamate dehydrogenase and cytochrome oxidase activities fell by 43, 52, 36 and 53 percent, respectively. Concomitantly lipid peroxidation increased by 80 percent. Pretreatment with TA (1 mg/kg; i.p.) 1 h before endotoxin injection prevented

death and ensured retention of 85-98 percent of baseline enzyme activities and essentially precluded a rise in lipid peroxidation. These observations demonstrated that the glucocorticoid TA is effective in preventing damage of mitochondrial membranes in endotoxemia. Tables 1; references 19: 14 Russian, 5 Western.

### Serotonergic Mechanism of Regulation of Cerebral Microvessels Tonus

917C0178 Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH I KHMICHESKIKH NAUK in Russian No 4, Jul-Aug 90 pp 45-50

[Article by V. S. Lutan; Kishinev Agricultural Institute imeni M. V. Frunze]

[Abstract] A detailed histofluorescence study of serotonin-containing cells of cerebral cells microvessels as a source of endogenous serotonin in blood circulation regulation and their precise location on cerebral tissue microvessels involved studies of laboratory rats, pigs, rabbits and chickens, with use of histochemical and microscopic luminescence methods. A population of serotonin-containing cells having no analogs in other organs appeared on the cerebral microvessels. Regularities of arrangement of serotonin-containing cells on the cerebral microvessels were attributed to the fact that the cells are located in regions of small arterioles and capillaries and in areas of branching of vessels. The regularities of location of the serotonin-containing cells on the cerebral microvessels indicated their participation in regulation of cerebral blood circulation at the microcirculatory level. Figures 2; references 6: 5 Russian, 1 Western.

### Spectral Sensitivity of Eyes of *Lymnaea stagnalis* L. and *Planorbarius corneus* L. Mollusks in Ultraviolet and Visible Spectra

917C0208A Moscow SENSORNYYE SISTEMY in Russian Vol 4 No 4, Oct-Dec 90 (manuscript received 6 Mar 90) pp 341-350

[Article by V. V. Zhukov and F. G. Gribakin, Kalinin-grad State University; Evolutionary Physiology and Biochemistry Institute imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad]

UDC 594.381:612.843.7

[Abstract] The spectral sensitivity of the eyes of 30 great pond snails (*Lymnaea stagnalis* L.) and 17 great ram's horns (*Planorbarius corneus* L.) mollusks was measured using an electroretinogram to identify visual pigments as a means of determining whether the mollusk visual system can perceive the ultraviolet section of the spectrum. The mollusk eyes and their attached optic nerves were isolated and used to test spectral sensitivity in the 300-600 nm range. The results demonstrated that the amplitude and kinetic electroretinogram parameters are quite similar for both species and similar to the electroretinograms of other gastropod species and bivalve mollusks. Results of ocular spectral sensitivity measurements also indicated a similarity between the two mollusk species. The rate of development of the electroretinogram is much slower in mollusks as compared to insects or vertebrates and is attributed to their slower rate of

locomotor reaction. While *L. stagnalis* exhibits its peak of spectral sensitivity at 490 nm, and *P. corneus* exhibits its peak at 495-500 nm, the results nevertheless suggest that the visual pigment is identical in mollusks from different taxonomic groups. Furthermore, although the research clearly demonstrates that these mollusks can perceive ultraviolet light, additional research is needed to determine what purpose this ability serves. Figures 6; references 27: 4 Russian, 23 Western.

### Light-Induced Changes in Response of Tectum of Carp Mesencephalon in Response to Baclofen and Bicuculline Application to Retina

917C0208B Moscow SENSORNYYE SISTEMY in Russian Vol 4 No 4, Oct-Dec 90 (manuscript received 6 Feb 90) pp 351-355

[Article by V. G. Yerchenkov and N. S. Garina, Moscow State University imeni M. V. Lomonosov]

UDC 612.843.215

[Abstract] A preliminary investigation was conducted on the effects of 10-15  $\mu$ l of baclofen and bicuculline solutions in  $10^{-4}$  -  $5 \times 10^{-4}$  M concentrations applied to the eyes (lens and part of vitreous body removed first) of 30 myorelaxant-immobilized carp. An electroretinogram was used to evaluate the pharmacological effects on the retina simultaneously with the elicited potentials from white and monochromatic light stimuli in conditions of adaptation to darkness and background lighting from below. The results demonstrated that baclofen elevated the amplitude of the elicited potentials at all light stimulus intensities, with the effect shown to be about the same for both types of adaptation in white and monochromatic light. Bicuculline's effect was similar to that of baclofen, but it evoked less of an increase in the amplitude of elicited potentials from the tectum of the mesencephalon in dark as opposed to light adaptation. These findings suggest that the qualitative and quantitative differences in the effects of the substances that occurred in the electroretinograms and elicited potentials of the tectum of the mesencephalon in response to monochromatic stimuli and in the two types of adaptation may stem from the varying sensitivity of the rod and cone systems of the retina to both baclofen and bicuculline. The results indicate a functional similarity in the effects of the GABA<sub>b</sub>-receptor agonist baclofen and the GABA<sub>A</sub>-receptor antagonist bicuculline to the retinal system that is involved in the formation of the visual afferent input of the tectum of the mesencephalon as well as in the generation of the electroretinogram. Figures 2; references 9: 3 Russian, 6 Western.

### Mitogenic Capacity of U-2 Fraction From Turtle Spleen

917C0296A Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 4, Jul-Aug 90 (manuscript received 22 Mar 90) pp 5-7

[Article by Ye. A. Sokolova, Ye. K. Prus, A. A. Belmesova, R. B. Usmanov, and A. A. Turdyev, Biochemistry Institute, Uzbek SSR Academy of Sciences]

UDC 576:591.11:598.13

[Abstract] The radiotherapeutic properties and stimulating effect of a U-2 fraction from a central Asian turtle (*Testudo horsfieldi*) spleen extract on human peripheral blood lymphocytes were investigated. From 15 to 50 µg/ml of the turtle spleen extract U-2 fractions were added to a culture medium, with 40 µg/ml exhibiting the best growth and shown to be sufficient for karyotyping the number of metaphase plates. These results demonstrated that the U-2 fraction of the central Asian turtle spleen extracts can induce lymphocyte blast transformation and thus can be used as a human peripheral blood lymphocyte growth stimulating factor. Tables 1; references 5: Russian.

#### Biological Activity of *Peganium harmala* L. Extract

917C0296B Tashkent UZBEKSKIY  
*BIOLOGICHESKIY ZHURNAL* in Russian No 4,  
Jul-Aug 90 (manuscript received 4 Jan 89) pp 20-21

[Article by M. Khamidov, A. U. Kariyev, and A. A. Umarov, Order of the Worker's Red Banner Institute of Plant Substance Chemistry, Uzbek SSR Academy of Sciences]

UDC 633.511:631.858

[Abstract] As part of the search for novel natural plant growth stimulants, the effect of an aqueous extract of the alkaloid-containing plant *Peganium harmala* L. was tested on cotton, wheat, corn, and cucumber seeds. The results demonstrated that soaking cotton seeds in the original extract prevented germination and a 10-fold dilution suppressed germination by 14-22 percent. However, a 100-fold dilution stimulated germination. The results also demonstrated that wheat seeds were more sensitive to the extract than the cotton seeds were, while cucumber seeds were less sensitive. In addition, the results also demonstrated that the alkaloid itself, desoxypeganine hydrochloride, stimulates growth in a  $1 \times 10^{-4}$  -  $1 \times 10^{-5}$  concentration, while in a concentration of 30 mg/l, it acts as a fungicide on *Verticillium dahliae*. Tables 1; references 5: Russian.

#### Computerized Comparative Assessment of Anticholinesterase Substance Toxicity

917C0296C Tashkent UZBEKSKIY  
*BIOLOGICHESKIY ZHURNAL* in Russian No 4,  
Jul-Aug 90 (manuscript received 7 Jul 89) pp 24-27

[Article by A. I. Isandarov, V. F. Smirnov, and A. R. Sirota, Central Asian Children's Medicine Institute]

UDC 340.627

[Abstract] This paper presents the results of an attempt to develop a unified system for analyzing and processing medical information and a system of criteria for assessing the toxicity and severity of chemical injury in organophosphoric pesticide poisonings. The hospital medical charts of 296 persons with peroral Malathion or Trichlorfon poisoning were analyzed to compose probit-graphs for use in determining probable outcomes of organophosphoric pesticide poisonings. An EC1035 computer with the SAS statistical software program was used to evaluate the toxicity of organophosphoric pesticides. The results demonstrated that general organophosphoric pesticide activity can be assessed by the level of cholinesterase activity. It was also shown that probit analysis of the function of the poison-concentration-effect and cholinesterase activity effect is a valuable instrument in investigating the quantitative relationships between the degree of chemical injury, cholinesterase activity, and nature of the general reaction of the body. Figures 1; references 3: Russian.

#### Effect of Thymosin on T- and B-Lymphocyte Concentration and Peripheral Immune Organs in Thymectomized Guinea Pigs

917C0296D Tashkent UZBEKSKIY  
*BIOLOGICHESKIY ZHURNAL* in Russian No 4,  
Jul-Aug 90 (manuscript received 29 Jan 90) pp 30-33

[Article by S. N. Zhumashev, Zh. I. Mamutov, and K. N. Nishanbayev, Central Asian Children's Medicine Institute]

UDC 615.37

[Abstract] The effect of thymosin on the lymphocyte subpopulation count and status of the peripheral immunity organs in conditions of a thymic hormone deficiency stemming from a thymectomy was investigated on guinea pigs. Thymosin fraction V (0.5 µg/g mass) was administered to the animals. The immunological indices were investigated and the leukocyte, splenic lymphocyte, and nucleated bone marrow cell counts were performed 40, 70, 100, and 190 days after the thymectomy. The results of tests performed 40 days after the operation showed no change, while the figures for the leukocyte and erythrocyte counts and hemoglobin concentration were depressed at 70 and 100 days. At 190 days the numbers of leukocytes and peripheral blood lymphocytes were even lower. The data demonstrated that removal of the thymus results in suppression of lympho- and erythropoiesis, while the administration of thymosin to thymectomized guinea pigs significantly elevated the lymphocyte count, with the figures for other indices approximating those for the control group. Thus, it was shown that thymosin helps eliminate thymectomy-induced changes. Figures 2; references 10: 7 Russian, 3 Western.

**Effect of Novel Medicinal Preparation Plaferon on Alpha- and Beta-Adrenergic Receptor Systems in Cells**

917C0297A *Tbilisi SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 138 No 3, Jun 90 (manuscript received 22 Mar 90) pp 642-644*

[Article by N. N. Dzhanashia, V. I. Bakhutashvili, D. G. Mikeladze, and L. B. Kartoziya, Experimental Morphology Institute imeni A. N. Natishvili, Georgian SSR Academy of Sciences]

UDC 615.015.44

[Abstract] The cellular receptor systems that interact with plaferon compounds were investigated using out-bred albino rats in order to determine the mechanisms by which these receptor systems act. Plaferon is an

interferon-containing lyophilized preparation synthesized by the viral induction of human aminochorin [sic] and has antiviral and immunostimulating effects. It was developed by V. I. Bakhutashvili at the Experimental Morphology Institute imeni A. N. Natishvili, Georgian SSR Academy of Sciences. Calculation of the kinetic binding constants of neurospecific ligands with  $\alpha$ - and  $\beta$ -adrenoreceptors of the rat synaptic membranes in the cerebral cortices and hepatic plasma membranes demonstrated that the dissociation constant increases while the receptor density remains the same. The results demonstrated that plaferon has no effect on  $D_2$ -dopaminergic receptors, and diminishes  $\alpha$ -adrenoreception while simultaneously increasing  $\beta$ -adrenoreception. The findings also indicated that plaferon has some effect on tissue growth and differentiation. Further study is necessary to determine whether plaferon will find clinical application as a preparation that can correct receptor activity dysfunction. Tables 1; references 9: 3 Russian, 6 Western.

### Perestroyka of Medical Field in RSFSR

917C0144A Moscow VESTNIK AKADEMII  
MEDITSINSKIKH NAUK SSSR in Russian Vol 10,  
Oct 90 (Signed to press 2 Feb 90) pp 59-62

[Article by A. I. Potapov and V. N. Shabalina: "Basic Problems of Perestroyka of Medical Science"]

UDC 61:001]:008(47+57)

[Text] The state of affairs in medical science, and the ways and forms of its further development have now become a subject of the most acute debate not only in the medical press but also in political, economic, sociological and other publications. And this, of course, is natural. Without the deepest reliance upon science, we cannot carry out fundamental transformations in public health, or solve the most important social and national economic problems. The health of the population is a unique mirror of the country's social, economic, demographic, sanitary and hygienic conditions. It not only reflects positive changes occurring in economics, labor, personal services, culture and leisure, but it also reacts sensitively to any negative trends in the complex mosaic of social phenomena.

It must be recognized at the same time that the level of our medical science is significantly behind that of world science. Radical measures to resurrect it are required. We attach priority significance in this case to the conceptual approach to finding ways of forming new structures and functions in the scientific sector of public health. First of all, science must be returned to its leading place in public health—not because of its intellectual elitism, but rather because of its capability for supporting the sector's scientific and technical progress. We need to constantly maintain public awareness of the high prestige of intellectual activity in today's conditions.

Bureaucratic ways have exhausted themselves completely in science. We need a new organizational system that allows the research scientist the freedom of choosing his direction of scientific inquiry. However, this freedom must be self-confirming in the competition for financing the development of proposed scientific ideas.

In medicine, fundamental science obviously cannot pursue any of its own special goals divorced from applied science and practice. For example, the creation of a fundamentally new medicinal agent, diagnosticum, instrument or method always passes through a stage of both fundamental and applied research, which ultimately come to a focus in a particular drug or method that is developed.

However, despite all of the artificiality of conceptual division of science into fundamental and applied, the fact remains that this division does exist in formal terms, and that such separateness does not promote optimum development of science. It should be noted that developed countries have kept the universities as the principal structural unit of science over a number of centuries. The

effectiveness of this form of organization compels us to return to a more detailed study of it. The RSFSR Ministry of Health is currently examining the question of creating a medical university. We see this as a specific form of communication between fundamental and applied research.

The RSFSR Ministry of Health is constantly seeking an optimum infrastructure for the network of departmental scientific institutions. Contradictions are evident here as well. Thus legislative expansion of the independence of institutions generated a certain tendency for collectives to separate themselves from scientific-production units already in existence. Following the principles of collective egoism, some enterprises of epidemiological and microbiological institutes want to raise their own material welfare by acquiring the status of an independent enterprise. We feel that this is wrong. We believe that strengthening the ties between science and practice is not an abstract problem, and it requires concrete solutions. Therefore our objective is to not only preserve the unity of a specific institute and its enterprise, but also to make this unity stronger and broader. In particular, we are currently considering the matter of creating a large association out of all institutes of epidemiological profile, and their enterprises. What we need as the basic structural unit of the network of scientific institutions is not isolated scientific research institutes but scientific-production units and companies capable of solving problems, not just studying them.

The RSFSR's transition to territorial cost accounting is raising new problems in the organization of medical science. In particular, problems are arising in regard to making scientific research institutes territorially subordinate. Our position is fundamental in this respect: There must be no such thing as "local science." Science will work as a single organism, one that accounts for the needs of all local public health organs.

The economics of public health remain a painful problem. First of all, the health of the individual is still not being treated as an economic category in the state structure of the national economy's organization; the state recognizes no economic relationship between the country's productive potential and the health of the individual. This is why the budget outlays on public health are not scientifically justified, being determined instead by financial experts on the basis of the infamous remainder principle. Then officials having very little awareness of public health problems apportion these allocations item by item. As to what criteria they follow in this, even they are hardly able to say. Such a system results in a careless attitude toward allocations at all levels of their use. This is why we have supported, and continue to support, introduction of cost accounting relations into the public health system. In the course of debate on these matters, we have been continually rejecting attempts at confusing the concept of cost accounting with paid public health for the population. Everyone knows quite well today that medicine in our country is not free, and that it is supported by public

assets. But it is still unclear in many ways what the optimum way to create this fund of public assets should be, and how it should be sensibly utilized.

One of the possible variants of the solution to this problem might be a procedure for financing public health on a contract basis. The government of the republic would provide a guaranteed volume of financing—for example, equal to its current amount being distributed through territorial organs of Soviet government. This financing volume would oblige the public health system to maintain the presently attained level of public health. Concurrently the republic's Ministry of Health, which has conducted a long-term medical, social and economic analysis of the health of the population and the possibilities for its improvement, proposes that the government sign a contract by which it assumes the responsibility of, for example, reducing, over a five-year period, the indicators of temporary incapacitation of the population by 20 percent, of primary disability by 10 percent, of child mortality by 25 percent, and so on.

In turn, the republic's public health system would receive supplementary annual financing equal to, let us say, 75-100 percent of the current volume of budget outlays to cover the corresponding expenditures. Additional allocations would be placed at the direct disposal of the republic's Ministry of Health, which would spend these assets on the basis of agreements (contracts) with local public health organs and scientific institutions. Elementary calculations show that this would be mutually advantageous to the public health system, the state and the people.

Solution of the economic problems of medicine requires, first of all, an official procedure for calculating the value of health (the loss of it) on the basis of the increase (reduction) of industrial production and nonproductive outlays in nonproductive spheres of the national economy.

The principles by which medical science is financed also remain incomprehensible. Who distributes assets such that in the RSFSR, science receives only 0.5 percent of allocations provided to public health? In this case the Ministry of Health does not have the right to even make minimum corrections in this rigid distribution.

If we wish to be on par with world science, we need adequate investments. The matter must not be resolved only by way of the budget; we should expand scientific research on a cost-accounting basis, including on the basis of direct orders from public health organs and institutions, and we need to legalize the right of scientific institutions to participate in the distribution of the profits industrial enterprises obtain from introducing the results of scientific research into production. But what we have instead today is a paradox where the equipment availability in a scientific institution is significantly lower than in an ordinary hospital. From our point of view we need to significantly increase imports of scientific apparatus and other resources to support a normal

research process. Concurrently we need to implement the most intensive measures to develop domestic scientific instrument-making. We probably shouldn't think it prudent that less than 0.5 percent of assets provided for imports in general are allocated to science.

We are currently coming around to thinking that the contract is the best means of distributing budget assets allocated to science.

In 1989-1990 the Main Administration of Scientific Institutions of the RSFSR Ministry of Health converted to contract relations with scientific research institutes. Last year showed that this was a progressive step, but it does not yet permit attainment of an optimum level of organization of scientific research.

We suggest conversion to a system of social orders for scientific research as the next step in optimizing management of science. Social orders would be documented in this case in the form of five-year target programs directed at solving particular problems. A social order (program) would be a complex of coordinated scientific studies taking the form of fundamental and applied (including exploratory) research, and scientific developments. A social order would be drafted by the joint efforts of scientists, prominent specialists, practical workers and executives of public health organs; it would be approved for financing by a central commission of the RSFSR Ministry of Health for scientific research planning. According to forecasts, 50-70 separate social orders for the development of the most urgent subdivisions of specific problems will be placed with scientific institutions of the RSFSR Ministry of Health and cooperating institutions of other departments in the 13th Five-Year Plan. Orders will be based on problems which, when solved, would fundamentally influence the state of the corresponding public health problem.

Such a social order would be documented in the form of a contract. A coordinating council of the PNTs [not further identified], headed by a chairman, would bear full responsibility before the RSFSR Ministry of Health for prompt, high quality fulfillment of the contract.

In turn, as the principal program developer, the PNTs would sign an agreement with specific cooperating institutions and determine their share of the total volume of credit allocated to the program.

Considering the uncertainty of the anticipated scientific result, it would be suitable to draw up a social order in the form of a "skeleton" contract, such that both the client and the executor would be able to make specific adjustments in the course of its fulfillment, and replace one position by another. However, the overall result of the contract should not suffer from this; its main goal must still be attained.

We still do not have any scientific developments pertaining to internal institutional cost accounting. The objective it seeks is for a scientist—the director of a corresponding scientific research project—to be the

actual administrator of credit allocated in support of the fulfillment of a particular agreement. A council of directors must make all of the most important decisions on the financial matters of scientific research institutes.

Introduction of scientific products remains one of the most important problems of practice and science. We feel it necessary to free the scientist of work outside his field—participating in the solution of organizational and technical problems associated with applying his developments in production, and dealing with their practical use (except in the case of functions associated with supervision by right of authorship). What is needed here is a professional—a management specialist. This is precisely the means by which we are now solving this problem—by creating a cost-accounting company for practical introduction.

It is well known that the principal motivating force of scientific development is the practical need of the results of its activity. However, dictatorship of the producer and the monopolism of industrial departments create a situation where the state financial mechanism guarantees the marketing of any product in the internal market irrespective of its quality, and thus precludes interest of producers in using scientific products. This situation also remains typical of public health. For practical purposes the quality of the technology of therapeutic and diagnostic assistance remains outside anyone's control in our country, and no requirements are imposed on its progress. Low attention to scientific developments, which is typical of practically the entire public health system, is a consequence of this.

But if we look at the problem of introduction from the standpoint of the international market, we find that the value of a scientific idea in its pure form—even a very good idea—is low, while the value of a materialized idea increases by several orders of magnitude. We, in the meantime, ravaged by a hard currency hunger, are doing everything we can to sell our "scientific semifinished products" in the form of licenses at cut-rate prices. We are reluctant to spend a few rubles to create the "material shell" about a scientific idea, but as a result we lose tens of thousands of rubles in both the domestic and foreign markets.

One of the most important mechanisms of reorganizing the public health system is its computerization: beginning with automated recording of information on patients and on material and other resources, and ending with logical recommendations on controlling the system as a whole. Science has not yet found its place in this area either. In order that the system for monitoring the sector's management would have linguistic and logical unity in the sphere of communication at different levels, in different subsectors, and between basic and auxiliary services, we need a general strategy for computerizing the sector, and a specific program accounting for the unique activities of all of the sector's units; we need unified rules and standards. Haphazard introduction of computerization into the public health sector carries the

threat of significant waste of material outlays and further deepening of the disharmony of the management system. This is an extremely serious, fundamental problem. We have delegated its solution to the newly created Center for Medical-Social Research on Economics and Information Science of the RSFSR Ministry of Health.

Radically raising the moral and intellectual level of scientific personnel is the most important means of surmounting the crisis in medical science. This problem is doubtlessly a product of a complex of different factors—primary and secondary. From our point of view we need to not only list them but primarily determine the conditions under which these negative factors would not be able to exist.

Mandatory, more-intensive rotation of scientific personnel in positions of leadership of structural subdivisions and scientific institutions is one such condition. The currently accepted practice of "lifetime" appointment to a position is the best way to achieve stagnation in science. We need a system of interested selection of capable people, and planned promotion of fresh forces into executive organs. Directors must serve for five years, and they should serve for 10 years only for special merit. A competent person in science will always find use for his intellect, experience and knowledge, and not just in executive positions. All the more so because the wages he might receive in the position of a main or leading scientific associate would be the same.

Next, a serious obstacle to development of Soviet medical science is its self-isolation from the science of other countries. The leading countries carefully select talented scientists from all corners of the world. Broad exchange of scientists between different institutions within a country and outside its borders is being constantly improved. We have full stagnation in this area as well.

The RSFSR Ministry of Health must possess a hard currency fund, and it must actively seek assets from international funds intended to support basic training of young scientists in foreign scientific institutions. We need to invite foreign scientists on a regular and open basis for work in Soviet scientific institutions, and send our own venerable scientists, if they are invited. It is precisely in such lengthy working contacts that the conditions for optimum development of the creative personality are formed.

There is one other point. The best period in which to begin shaping the scientist is in his years of training in higher school. But rather than teasing young people with science through student scientific societies, we should create all of the conditions allowing the student to participate in real scientific work, in work hand in hand with his mentor and instructor, with a scientist. Both the rate and quality of formation of scientific potential will depend in many ways on these initial efforts.

The growing tendency to overload many of our scientists with more and more new posts and functions is a negative factor in formation of the scientist corps. This is

a hindrance to the advancement of young forces and to preparation of a worthy replacement. Conditions promoting a new period of stagnation are created as a result.

Finally, razing the cult of leaders in science to its foundations, we need to create faith in the power of reason, and respect for scientific proof, evidence and facts. It is precisely in this way that a scientist develops high moral principles.

In conclusion, we would like to emphasize that all efforts should be exerted to raise the prestige of medical science on a statewide scale. This requires that we begin not with motives of ambition and not with deep envy of representatives of "second-class" science, which is what medical science presently is. The prospects for our nation's survival are dictated by the need to raise medical science to a "first class" level. This is a basic problem of any state, and all other problems are its derivatives. We certainly need to reckon with the following realities: Half the seats in the U.S. Academy of Sciences belong to medical specialists; in terms of financing volume, no other branch of science can compare with medical research in the USA. Deep knowledge of the genetic, biochemical and physiological principles of life, coupled with the ability to protect biological structures and functions of human organization from various external factors, provides us with the best means of protecting the population both from the natural aggression of the external environment (microorganisms) and from agents of industrial and military aggression. The present course and prospects of development of science are persuading us with increasingly greater insistence that we need to reexamine state scientific doctrine with an eye on fundamentally shifting its focus in the direction of biomedical, fundamental and applied research.

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#### "Narcotest" System

917C0348B Moscow VECHERNAYA MOSKVA  
in Russian No 3, 4 Jan 91 p 2

[Article by B. Samoylov, under title "Proving Grounds for 'Narcotest' System", under the rubric: "Perestroyka: The Quality of Medicine"]

[Text] It is no secret that in recent years narcotics addiction has acquired the character of a universal calamity, which can even be compared with AIDS. How can this plague of the 20th century be effectively combatted? Thousands of specialists of various fields of knowledge are attempting to find the answer to this urgent question.

The phrase "proving grounds" is usually associated with the military sciences, with the explosions of artillery charges, and the detonations of aerial bombs. I am making this report from exclusively peaceful proving grounds. They are located not out in the field, as are the military proving grounds, but in one of the rooms of the All-Union Institute of Medical Instruments Building.

And it is not armaments for the annihilation of people which are concentrated here, but instruments which are helping people to preserve their health.

At these proving grounds specialists are being trained and a system for the determination of the presence of narcotics in the human organism is being tested. Here a laboratory worker pours solutions, biological samples, into test tubes. He adds reagents. He places the test tubes in special cassettes and loads them into a computer analyzer. The setting of the computer is entered on the key board. After several seconds, the necessary information appears on the display screen and on a paper tape.

This is what Aleksandr Kaufmann, a scientific associate of the institute, one of the inventors of the new development, told us:

"I would single out radioimmunological microassay as one of the most effective methods for the detection of narcotics. It is based on the reaction of specific substances, namely, antibodies, with the narcotic in the biological sample taken from the patient.

"An infinitesimally small and harmless amount of a radioactive isotope of iodine, the period of half decay, and consequently, the half-life of which is only 60 days, is used as the indicator. This is fine from the safety point of view.

"The exceptional sensitivity of the method makes it possible to detect microscopic amounts of narcotic substances in the urine and saliva. That is, there is the possibility of taking samples without invading the organism. The period of time in which the narcotic may be detected is substantially increased. Even two weeks after a single use of a narcotic its presence can be established with confidence.

"As compared with other known methods, the reliability of the analysis is increased, and the interfering and masking effects of other substances contained in the sample are eliminated.

"The 'Narcotest' system has been produced in the institute for the performance of the radioimmunological assay. It consists of an electronic system, an analyzer measuring the level of radioactivity of a sample and a mini computer. The computer determines the amount of narcotic present by means of a special program.

"The measurement procedure itself is simple. The sample taken from the patient, several drops of urine or saliva, is mixed with reagents.

"The pellet, i. e., the reaction products which form the immune complex, is separated in the centrifuge. It is then placed in the analyzer. Subsequently, the system works automatically. The laboratory worker follows the course of the process by watching the display screen.

"The productivity of the 'Narcotest' system is great, up to 80 samples an hour. And its sensitivity is such that it detects one ten-billionth of a gram of the narcotic".

"I would like to add," says A. Kaufman, "that not only narcotics can be detected by means of this innovation. By changing the reagents it is possible to detect approximately five hundred more biologically active substances: hormones, vitamins, allergens, and viruses, including those of hepatitis and AIDS."

"The sphere of application of the system is truly wide. For example, it can be used in the organization of mass examinations in the population in endocrinology, oncology, cardiology, pediatrics, hematology. The system is already being used for the monitoring of the state of the thyroid gland in individuals living in districts which have suffered from the Chernobyl accident. A special program which has been equipped with the "Narcotest" system offers the possibility of arriving at a diagnostic opinion."

#### Bureaucratic Obstructions to Innovation in Soviet Medical Care

917C0348C Moscow *IZVESTIYA* in Russian 12 Feb 91  
Union p 3

[Article by S. Tutorskaya, under the title "Rejection Reaction: Why It Is Hard for New Ideas to Take Hold in Contemporary Science, and Their Creators Doom Themselves to a Life of Torment"]

[Text] This week a strike of medical workers awaits us. This is unheard of. Although, to tell the truth, it is surprising how long they have tried to draw attention to their problems by, so to speak, peaceful means. So that people would understand at last that it is impossible to work when the means to help patients are not there, especially medications.

Just a little while before, at one of the "lofty" conferences, the well-known pharmacologist Professor Kharkevich stated: "There is no desire to create new preparations. People throw up their hands when they know beforehand that not one medication, however much it may be needed, is going to be placed in production."

About three years ago "Izvestiya" told the story of the fate of a well-known scientist, the experimental physiologist Vladimir Petrovich Demikhov. He, who had studied with the eminent Christian Barnard and other foreign researchers, was condemned by the "fathers" of Soviet public health to a pitiful existence in the semi-basement where his laboratory huddled for long years. And this scientist's main work, the transplantation of the heart, was condemned for many years.

After the newspaper reported this, the world did not turn upside down. And yet something did happen. The name of Professor Demikhov was added to the list of candidates for State Prize laureates for the development and introduction of operations on the cardiac vessels. And by right: he was the first to carry out the complex operation in an experiment, by creating a new channel between the arteries of the heart.

But, after all, the prize will not bring back the time already passed, will change nothing in the long chain of humiliations and stiflings which the brilliant experimenter was condemned to endure. And even now the whisperings have not died down: there is something "not right" in his character.

No, this is not a matter of character. It is matter of challenge which a brilliant individual who thinks along non-standard lines represents.

There are few, the happy chosen few, who have dared to "smudge the map of the routine days", and who have not paid for this with their health and their career, and the main thing, with the destruction of that which they have created with their labor and inspiration. Let us digress to a story from a field other than medicine. The talented scientist, Yu. Emelyanov, created an ozonizer for the industrial purification of effluent waters and the air, and for a number of other useful purposes (and the first two would be more than enough). This involved the production of an industrial batch. The rector of Moscow State University [MGU], Academician Logunov, personally kept an eye on the problem; people in the Soviet Council of Ministers took an interest in it. And then what happened? By the will of the Dean's Office of the Chemistry Faculty of Moscow State University, Emelyanov's apparatus was transmuted by means of crowbars and sledge hammers into a heap of iron trash. Much has been written about this. "Izvestiya" came to the defense of the scientist... fruitlessly. There is no limit to the power of the routine. A scientific idea can be murdered with impunity. True, public opinion is on the side of the experimenter, the innovator. But then, the real levers of power are on the side of the army of "stick-in-the-muds", which, in the words of K. E. Tsyolkovskiy, stands in opposition to any new idea.

All sad stories do not have happy endings. The fact of the matter is that to the inertia and conformism of the crowd, which is to some degree unavoidable, we have added yet another handcrafted "superstructure". This is the bureaucratic and, from the outset, senseless system of the administration of science. Or, with greater accuracy, it ought to be called a system of collective irresponsibility, a system implicated in scientific monopolism. It would seem incumbent on it to advance the new. But there is no clear procedure, nor contemporary experimental base, nor independent review of ideas, nor (and this is the main thing, and linked to the preceding) material responsibility for the harm caused to the state and the inventor, if a valuable idea is buried without any substantiation. The people who signed the order for the destruction of Emelyanov's apparatus did not answer for their arbitrariness with a single hard-earned ruble of their own. And yet the apparatus was patented abroad, and orders for it came from 80 companies. It differs from today's imported apparatus advantageously in its compactness, efficiency, and lower cost.

You probably haven't given this much thought, dear reader: Why is it that in our country which is so rich in

talent that the sphere of life and work which can be called the final product is meager to the point of tears?

With regard to medical science, its product, so to speak, is health, the prolongation of able-bodied, productive life. Are we not rich in ideas in this sphere of human daring, and yet things go worse and worse with the "final product".

The lives of our people have in some way diminished, and not only because of the onerous daily life and less than complete diet. New methods of treatment are not being introduced. In the Soviet Ministry of Health there is a subdivision which is called upon to bear responsibility precisely for this. But to tell the truth, as far as this goes, in no way are they capable of bearing responsibility. When there is one inspector who is responsible for nephrology and gastroenterology for the whole country, and he does not hold in his hands the working levers of power, of which we spoke above, this all becomes pure bluff.

Understanding that especially conscientious, brilliant minds are found among the authors of new ideas, they have created for them the following bureaucratic vagary: It turns out that what can seriously be considered introduction of new ideas is the publication of a brochure approved by the Ministry of Health. This amounts to believing that a menu published in a large edition is a meal. And so, having fought its way at all levels of authority, having accumulated plenty of bruises, another author of an idea, woe unto him, begins to report a paper introduction as if it were a real one. And the idea itself, you see, has long since had its neck twisted.

Something like this happened to Ivan Mikhaylovich Bondarev. He developed methods for the treatment of lung diseases, mainly tuberculosis. Quite a lot of resources had been wasted on patients, but the effect was not pleasing.

The doctor suggested an original treatment method. Powerful antibiotics were typically given to the patients. Specifically, two tablets three times a day. But what if, thought the doctor, we tried to administer a concentrated dose of the medication directly into the cavity in which the disease had settled? Bondarev invented an apparatus for this kind of administration (it was patented in 1979 in the USA). Medications for the new treatment method and everything else necessary began to be produced in our country (there is also an inventor's certificate). The method was used in the Department of Intensive Therapy of the Moscow Scientific Research Institute of Tuberculosis [NII].

At this point I can easily see how the thoughtful reader has put aside this newspaper and is dumbfounded. Who is this Ivan Mikhaylovich that he, so to speak, has had the vision of an eagle, has invented, and introduced, and is treating people??

It's all true. With one correction: He was treating people.

Ivan Mikhaylovich Bondarev was, until a certain time, the director of that Scientific Research Institute where he was working and treating patients. At that time he was able to travel and to deliver a scientific report at a Scientific Congress in Belgium. The method drew general attention by virtue of the fact that it makes possible a sharp reduction in the number of bacterial carriers and chronic patients. The Americans then invited him to present an hour-long report at the Pan American Congress of Phthisiatrists in Uruguay.

The professor never got to Uruguay. At the Ministry of Health they said: "If you travel on 'their' money (there had been such a suggestion) it is somehow inconvenient. To travel using our money, well, there isn't any." As the perceptive reader has guessed, Ivan Mikhaylovich at that point was no longer director of the institute.

Soon after other departments urgently needed beds. The professor was left without patients. And the patients and doctors were left without the new treatment.

At the next competitive reelection, the professor discovered that his job was also not on the list of vacant positions. So how was he to be selected; naturally, he wasn't. His laboratory was closed. The introduction of the new method was accomplished on the basis of a domestic model. And what about the order from the Ministry of Health of the RSFSR, in which dozens of clinics were advised to put Bondarev's method to use? Nothing came of it. Articles were urgently written to the effect that it turns out, in the simplest possible terms, with this treatment you will murder the patient.

The professor was in luck as long as the directorate shielded him. The directorate came to an end, and a report was drawn up in which, disregarding the entire set of accumulated statistics, his work was declared ineffective and unnecessary. He knocked himself out in vain, trying to prove that the facts were misrepresented and incorrectly interpreted. The commission designated by the Ministry in this past year has confirmed this! It would be fine if once the truth were restored, everything would return to its former state.

But... when there is no person, there is no problem.

Everything that the professor sends up goes back to the same group of people who signed the false report. And so it seems to Ivan Mikhaylovich that it is all a conscious genocide in relation to the patients, an action skillfully aimed and accomplished. That's right, no more and no less. He writes: 40,000 patients die every year from tuberculosis because criminals destroy them in their own personal interests.

Quite recently, Bondarev, having attempted to turn to the party organs and having again experienced a fiasco, left the CPSU [KPSS] (the Communist Party of the Soviet Union). When he had trodden the paths of war he had been proud to be a Communist.

His Majesty Conformism has ruled us many years, "marking" from childhood those who ask unexpected and inconvenient questions.

"Mediocrity alone has seized us by the shoulder and is not strange...", wrote A. Pushkin more than 100 years ago. We have gone further. In the bureaucratic system which watches over the scientific quest, mediocrity has seized one directorial rung after another. A crazy paradox: Yesterday's C students now direct the Demikhovs; a scholar of world renown fears to object to the untalented inspector.

Now here's something worth thinking about: In the USA there is a sort of "bank of crazy ideas". Sure, a suggestion is made and seems crazy... today. But what about tomorrow? We ourselves have examples of this sort near at hand. And, as a rule, right under our noses. The authority of true knowledge is as before squeezed out by the modest, but unquestioned embrace and iron logic of mediocrity. Its premier property is the inability to be surprised. Not to be surprised maliciously, darkly, and stupidly (amazing, not dry behind the ears and already he's made out!). But to be amazed, sincerely and disinterestedly.

This is the radiant shock, the gratitude for the joy experienced at the discovery of the new, which here, it would seem, is extraordinarily striking? But, alas, in a society where for years it has been asserted that "among us no one is indispensable," and where the word "genius" in ordinary parlance has revealed a similarity to the word "psycho," the norm of health of social life, to love talents, to forgive their strangeness, to be proud of them, and bear with them, has been reduced to naught.

In every packet of new mail I look for an envelope from authors of my acquaintance. Here's Mikhail Antonovich Moroz again, a surgeon from Rovno. And again, to his own sorrow, an inventor. Several years he drew attention to a very severe ailment: postoperative wounds of the urinary bladder which fail to heal. Mikhail Antonovich invented a device by means of which the wound is sutured durably, reliably, and rapidly. Improvement is guaranteed twice as fast, and there are no complications.

The surgeon knocked at all the doors with a single request: Help me disseminate this experience to other hospitals. This would save money, and free up expensive surgical beds. Naive doctor-inventor! In Kiev, in his "own" sectorial leading institute of urology they answered him: to suggest your own methods to others is immodest. To take on severely ill patients, who have been refused by everyone, for treatment, is also "immodest". And to give a lecture on one's method, it turns out, is "unauthorized". But in essence: Shut up! Who the hell are you? And indeed, who? If they have already devoured the director of the Scientific Research Institute of Tuberculosis, whose work is widely known throughout the world, what can a simple doctor expect?

"But after all, creativity," notes Mikhail Antonovich reasonably in his letter, "is not the exclusive sphere of

activity of the associates of the Scientific Research Institute." "Izvestiya" has written more than once about the method of Dr. Moroz. So far the result has been zero.

One recalls in this connection one of the stages of the epic with a katreks [transliteration]. And how, incidentally, do things stand with this matter at the moment, readers may ask. Aleksandr Gachechiladze is continuing to study the preparation in his laboratory. And for several years before the publication in "Smena" raised the hopes of a multitude of patients and their families the following occurred. E. Paton, the president of the Academy of Sciences of the UkrSSR [AN USSR] assigned the R. Kavetskiy Institute of Oncological Problems the task of studying the properties of katreks. The scientists experimented on animals. They established that katreks is a good immunomodulator, that is, it increases the defensive properties of the organism. The results of the experiments and the protocols were presented to the Pharmacology Committee of the USSR Ministry of Health [Farmkomitet Minzdrava SSSR].

This organization made no response to the recommendations contained in the report. When, however, katreks was rashly termed an anticancer method in "Smena," no one even remembered the three years of work of the scientists of the Institute of Oncological Problems. It was as if the recommendations didn't exist. And, by the way, these recommendations indicated that katreks should be used in stages I-II of the disease along with antitumor preparations, and not instead of them. All this was simply thrown away (we are, after all, a rich country), and the preparation was prescribed in eight clinics with tumor stages III-IV. Judge for yourselves, whether anything rational can be born after such "trials."

When I myself became acquainted with those who have taken part in this story, they were on the verge of exhaustion. Those who had studied katreks for three years, the lack of respect for the results of the experiments was astonishing; apparently they had been at cross purposes with the ready-made conception. I now very much doubt that katreks will ever show up at the drugstore in a Soviet version. Perhaps the Japanese, who are very much interested, will do something.

Oblivion and perdition, this is the lot which awaits many preparations which have, so to speak, been nurtured tenderly, publicized, born of eminent "parents" in flourishing laboratories. Twenty (!) years ago we were proud of the fact that Leningrad pharmacologists of the Institute of Experimental Medicine synthesized the new preparation ethimizole, which helped to save newborns. Who did not promote it, what powerful godparents stood at the cradle... And then? It was not produced commercially, nor is commercial production in sight. The preparation has been tied up in the reconciliations and in more and more new demands of the Pharmacology Committee, simply put, in the bureaucratic impasse.

A lot of preparations have lost their way there, including, for instance, myelopid. Here is what our reader, A.

Dubasov, has written about it (in 1956 he received a large dose of irradiation): "I was doomed and condemned to death by the doctors. Two weeks after taking myelopid, I was playing basketball with my grandson no worse than the youngsters (at 55). This preparation in combination with globulins could possibly help the victims at Chernobyl, or in other similar situations."

So what's going on? In 1988 the Academic Council of the USSR Ministry of Health informed A. Dubasov: Development had been held up because the Institute of Immunology, where the preparation was synthesized, had not been presented the technical documentation. This was signed by L. Shluger.

And here we come to some very important connections. To understand them is to elucidate how it is that, in science, innovation and experiment has come to be driven into the situation of the "fifth wheel." In order to invent the same ozonizer or synthesize a medication, a scientist must be a scientist. In order to make his apparatus in plastic and metal, to put together the technical necessities for the medication, he has to be an engineer, and know and be capable of a lot more. Including, unfortunately, how to open the doors of the lofty reception rooms.

Let us suppose that a man stands before us who does not know how to do precisely this. Maybe he is even disputatious and intractable; so what then? Should an idea be consigned to rot on some nameless trash heap for that reason alone? I personally know Nikolay Aleksandrovich Shluger who wrote the answer regarding the introduction of myelopid. Now can you imagine, if a superb prize were offered to him and all who would really help to introduce it? Then it would not be the inventors who were running after Shluger, but Shluger after the inventors. Perhaps, finally there would even appear an extremely necessary experimental link, where the innovator and the inventor would be helped to put together the documentation, to make up the drug form (we demand even this of the inventors; it's lucky they aren't ordered to fill up the whole country with tablets all by themselves). And there might be a genuine interest at the Academy of Medical Sciences [AMN SSSR], the Ministry of Health, and the Pharmacology Committee in the experiment and new knowledge; such support might have appeared long ago. And with all the positive consequences that would flow from there.

Now those very administrators of science, who have been so completely entrenched by monopolism and the distrust of the new (especially if it does not come from their own walls), have themselves fallen into their own trap. Why? Because when the thrill of inspiration descends on their associates, and everyone in the leading institute wishes to introduce the novelty, this innovation will fall into the same imperfect, defective so-called introduction system, insolent as the result of its impunity and idiotic organization, which is in fact a bureau of public funerals for new thought.

We justly curse our medical services. But let us not forget that it is a part of our general organization. We too rarely ask ourselves, how many amazing finds and new treatment methods have remained unrecognized? Why does our incredibly gifted nation, despite all this, still give birth to talented individuals, and no one opposes the meaningless vegetating, the humiliations and defamations, to which they are subjected?

Who are we, indeed, if we pretend that given all this (not to speak of the beggarly support of the majority of scientists, experimenters, doctors) we expect worthy medical services, as if by magic?

How has it happened that the departmental functionaries and "C" students in the sciences have proven quite often to be stronger than the influence of the schools of science and great personalities? These are from the flourishing tribe that has grown with the party bureaucracy, that has emasculated the essence of scientific inquiry, that has placed on science in an abased position. The precept of the great I. P. Pavlov has been forgotten: only by passing through the fire of experiment can medicine rightly be called medicine. And how diabolically adroit they have been for many years in justifying even their own inaction and their disrespect for the scientist's labor... out of concern for the well-being of the people. I remember how the "fathers" of public health loved to repeat: "It takes us a long time to introduce medications because we test them thoroughly. This is not the business jungle. That's why we don't do heart transplants, because we take pity on our people."

And what about today? There are no medications at all any longer, especially vitally important ones. As far as heart transplants go, we lag behind the other developed countries.

By movingly defending us against new and risky treatment methods and investigations (once upon a time, it comes to mind, Ilizarov's apparatus were labeled murderous), the same organizers of public health prove to be incredibly impotent when they really see human experiments which are totally unjustified and illegal. Why did Minister of Public Health I. Denisov, a physician, grant permission for mass psychotherapy sessions on the state TV channel? Influence by correspondence, through hypnosis and suggestion, are impermissible, however vehement the letters sent everywhere by the adherents of A. Kashlirovskiy. This, as one specialist correctly expressed it, is a manipulation of the human psyche, the most gross violation of the principle of "primum non nocere", which is inadmissible even for a minister.

Where in this instance is the concern for our interests? And right on the heels of this permission, a whole flood of telehealers gushed out onto the screen. Already they are "cleaning out each other's energy capsules." People have stopped looking after their health, entrusting themselves entirely to teleconjurings. This has been written about more than once, but "Vas'ka hears and goes on eating".

But we will not be seduced. Another individual will appear with new ideas in medicine that will throw down a challenge to existing notions, and an entire chorus of authorities will rush to persuade that this is a direct threat to our health and life. Remember: The reactionaries carry on the war not on behalf of your health and well-being. The real war goes on against the independent, insubordinate rudeness of creative thought.

### Effect of Chernobyl Radiation on Novozybkov

917C0353A Moscow SOVETSKAYA ROSSIYA  
in Russian 10 Jan 91 p 4

[Yu. Lodkin, TASS Correspondent: "Vacuuming Up Cesium"]

[Text] It is currently estimated that nearly 1,500 of the populated areas in the southwestern regions of Russia are radioactively contaminated as a result of the catastrophe at Chernobyl. The largest of these areas is Novozybkov with a population of 40,000. According to official data from the USSR Goskomgidromet, an average density of cesium-137 pollution of more than 17 curies per square kilometer has been recorded.

Each resident of the city from young to old knows that a wooden house diminishes the external radiation two-fold, while a brick house reduces it by ten-fold. But it seems that the walls are not always a protective barrier. Here is what Valentina Vasilyevna Maksimova, who lives downtown in one of the houses on the street Ulitsa imeni 307-oy Divizii has to say:

"My severe headaches and fatigue caused me to think that my apartment had an elevated radiation level. But I was not as worried about my own ills as I was about the health of my 18-year-old son. He was in an automobile accident a year ago and had many broken bones. He had approximately 30 x-ray examinations during his treatment. An even larger dose of radiation was added to the already high dose. On November 4, in response to my request, our house was measured for radiation. The level here was several-fold higher than normal. The results were the same for the other apartments on our floor. And then we remembered that the house was not yet completed at the time of the Chernobyl accident, and that radioactive fallout was probably on the coverings between the floors.

The municipal executive committee then recalled the spring of 1986. There was another uncompleted apartment house at that time, on Ulitsa Pervomayskaya. The radiation supervisors found a total of 36 "radioactive" apartments. The Bryansk Laboratory of the Leningrad Radiation Hygiene Scientific Research Institute located in Novozybkov recommended that the level be reduced in the apartments "glowing" with radionuclides. But it was made with the provision that if the residents of the above-named apartments received only a small amount more of radiation, the recommendation could be disregarded.

The citizens of Novozybkov have openly expressed their lack of faith in the hygiene radiologists based in their city in many letters and oral statements. They doubt the conclusion of the Leningrad hygiene radiologists about the harmlessness of living in the "glowing" apartments. The Leningrad people believe that increasing the radiation dose by 0.12 rem [roentgen equivalent man] "will not harm the residents' health." However, according to calculations by the municipal sanitary and epidemiology department specialists, this additional dose will not permit the apartment dwellers to stay within the range of the acceptable annual radiation dose set by radiation safety standards.

V. Tokarev, municipal executive committee chairman, stated that "the residents of the contaminated apartments should be relocated while the complex is decontaminated. But the radioactive rooms need to be treated one at a time, since there is no place where the people may be relocated. The housing situation in the city is very critical."

This conversation took place more than one and a half years ago. During this time, only one apartment has been treated. The radiation level was cut in half.

The citizens of Novozybkov are not satisfied with the measures that have been taken to clean up the effects of the Chernobyl catastrophe. There are serious shortcomings in providing the public with clean produce and the home appliances such as refrigerators, washing machines, and vacuums, that are so needed here. Gas is not yet being supplied to many of the apartment houses, and the people are forced to "burn" radioactive peat. The outskirts of the city are choked with radioactive dust in the summer because of the lack of roads.

A massive outflow of young workers and specialists has begun. The factories and plants are literally destitute because of the shortage of workers.

"We cannot keep the workers," says general director of the Novozybkov Machine Union N. Bykov. "The business routine for the trained personnel has become critical: we are trying to attract foreign workers. We do not foresee an improvement in the situation; the further emigration of people is unavoidable. If the current 'emigrant trend' holds and the young families leave the city (in concern for the health of their children, they are the most likely to leave), then we do not need to guess what the fate of the local factories will be. They are doomed to close."

The residents that leave the radioactively contaminated regions need specialized medical care, and they are hoping that it will be organized for two to three families that are somewhat backwards in their ways, at least naively. There is something behind the fact that the specialists that developed the program for cleaning up the Chernobyl accident insisted that the people be relocated by the village, rather than one by one.

It seems that the cup of patience runneth over for the Novozybkov residents. A grave situation developed at the "Induktor" factory. The collective of this factory suggested that the entire factory be moved to an uncontaminated territory in the Bryansk Oblast. First, a residential village would need to be built, from which the Novozybkov residents could get to work by a watch method until the factory could be moved. Many of the Novozybkov residents support the opinion of the "Induktor" collective.

### **Intense Radiation Zones Discovered in Krasnodar**

*917C0353B Moscow MEDITINSKAYA GAZETA  
in Russian 12 Dec 90 p 1*

[Ye. Smirnova: "Round Dance at the Gamma Level"]

[Text] We really live without knowing. We become ill without knowing the true causes. For two months the specialists from the Koltsovskiy Prospecting and Surveying Expedition of the USSR Ministry of Geology investigated the status of the radiation level in Krasnodar. The results were astonishing. In some places in the city they found sections of heavy radiation, up to 3,000 microroentgens per hour (normal is 10-12 microroentgens per hour). The municipal executive committee created a special staff for cleaning up the hazardous areas. This staff consisted of directors from the executive committee, sanitation service, civil defense agencies, and others.

On Ulitsa Promyshlennaya, in the very center of Krasnodar, the dosimeter indicators suddenly began to oscillate. The mobile radiological laboratory had to temporarily close down in the middle of the street. The dosimeters indicated a level almost 100-fold above normal on a section of land approximately 150 square meters. Apartment houses surround the area, and there is a kindergarten a few meters away. The hazardous section is fenced and has been taken under protection. The kindergarten was immediately closed, and the emergency entrances of the apartment houses were opened on the opposite side of the hazardous area. Teams of clean-up experts attired in protective overalls and respirators began digging up the earth. The deeper they dug, the higher the radiation indicators rose. It seems that they were "leveling" metallic objects covered with glowing paint and chips of the paint itself. And then they remembered that aircraft repair shops had been located in this area 20 years ago. When they were taken away, the leftover equipment and paint were buried and the ground leveled.

The work on cleaning up the area lasted three days. All of the exhumed earth was sorted by degree of contamination. The most contaminated earth was taken away in a special combine for burial, while the less contaminated soil was dumped into a special ditch, lined with a polyethylene film, beyond the city. Then the ditch was covered with clean earth and asphalt.

On Ulitsa Planovaya, near a private apartment house, the mobile radiological laboratory also recorded 1,200 microroentgens per hour. The level came from the pipes that the owner of the house had gotten "by accident" for domestic needs and had already partly been used for erecting a fence.

These are only two episodes of the series "Our Little Chernobyl", as the Krasnodar residents now call their city. The work on cleaning up the hazardous areas is enormous. The indicators on the instruments have settled down. But the people have not. They ask questions: Why, for example, did we have to wait for government resolutions to investigate the gamma level in major industrial centers? Why did special teams need to be created for this purpose rather than entrusting the radiological departments of the major sanitation and epidemiology stations with this work and then reinforcing them with the staff and necessary equipment? Now they are limited in their activity to monitoring the operation of reading the radiation instruments. Why not measure the gamma level when selecting an area for construction of apartment houses, children's establishments, and hospitals? After all, the kindergarten on Ulitsa Promyshlennaya was almost constructed right on the radioactive section. Incidentally, the construction of additional kindergarten buildings was planned adjacent to that first kindergarten. We feel that not only the RSFSR and USSR Ministries of Public Health, but also all those who work with radiation can and should answer these questions. And they should not only answer these questions, but should also take specific measures for protecting public health.

### **Disposal of Radioactive Meat in Gomelskaya Oblast**

*917C0353C Moscow RABOCHAYA TRIBUNA  
22 Jan 91 p 2*

[A. Zhuravskaya: "'Dirty' Meat"]

[Text] Since April 4, 1990, 518 tons of radioactive meat has been found at the Iolcha Station in Gomelskaya Oblast (from an official report).

Four years ago wagons with this ill-gotten meat were sent from the Gomelskiy and Kalinkovichskiy Meat Products Plants to Soviet Georgia. The receivers refused it and sent it back. It became obvious that the hazardous products needed to be buried in a special burial site. However, the wagons became "no-mans" and continued to roll along the nation's railroads. Then 37 refrigerators at the disposal of the director of the Southwest Railroad in Oleynik arrived April 4, 1990 at the Iolcha Station, coming from Pripyat. They stand idle there.

"The seriousness of the possible consequences is perfectly clear," says A. Dedok, junior justice adviser for the Gomel Environmental Protection Public Prosecutor. "What will really happen? Sedov, general director of the "Pripyat" Scientific Production Association, has instructed that the contaminated meat be buried in the

village of Kolyban in Braginskiy Rayon, without even considering the need to ask the opinion of the local Council of People's Deputies about this. But Kolyban is in an area of estrangement. The radioactive contamination with cesium-137 in some areas here is 1,000 curies per square kilometer, with a radioactive level of 1.7 - 2 milliroentgens per hour. The liquid manure tank that he wants to use for burial is in no way equipped for either protection from radiation or from a hydrological point of view. The reservoir is close to ground waters and a creek that empties into the Dnepr. Moreover, the "dirty" meat is already decaying. Such wastes should never be concealed in an unequipped area.

"There is also another side to the coin," continues Aleksandr Nikolayevich. "According to data from the ROVD [as published], the 'Iolcha' meat is being sold in area markets. (Research conducted in the 'Pripyat' Scientific Production Association Laboratory indicated the presence of a ptomaine poison in it). The seals have broken and the doors are open in some of the wagons. At first the wagons were protected by patrol sentry details from the Ministry of Internal Affairs troops and the rayon militia. Now, there are only two teams of mechanics at the refrigerated cars. Their duties include maintaining the equipment in operating condition.

Altogether, the damage has been more than 5 million rubles. Just one hour of standing for this type of wagon costs nine rubles; the cost of the refrigerator alone is 350,000 rubles. Their future use has been complicated by the years of storage of "dirty" meat in them.

"Four years have passed since the Chernobyl Nuclear Electric Power Plant, but the radioactive meat has still not been buried. Why is this?" I asked V. Burnyak, the first deputy chairman of the Belorussian SSR State Committee on problems of the catastrophic consequences at the Chernobyl Nuclear Electric Power Plant.

He replied, "There really is meat contaminated with radionuclides in Belorussia in addition to what is at the Iolcha Station. It needs to be buried as soon as possible. The problem has dragged on because the employees of the Minatomenergoprom [Ministry of the Atomic Energy Industry] did not want to build a special burial site, but rather preferred to simply bury the meat in the ground."

It now appears that something is being done. An area has been set aside for construction by the Minatomenergoprom in an isolated area of Norvlyanskiy Rayon with the agreement of the residents there. But what will happen when a snail eats there?

**Belorussian Center Practices Alternative Medicine**  
**917C0526A Minsk SOVETSKAYA BELORUSSIYA**  
**in Russian 3 Apr 91 p 4**

[Article includes interview with Aleksandr Genrikhovich Ruzhitskiy, commercial director of the Belorussian Center for Alternative Medicine, by A. Zeldin, dateline

Minsk, under the rubric "At Your Request": "When Drugs are Powerless...To Your Aid Comes 'Altered,' Which Is Realizing a Promising New Area of Medical Science and Practice—Medicine Without Drugs or Surgery"; first paragraph is source introduction]

[Text] For three years, I. Kravchenko, a worker at the Bolshevik Tanning Plant, couldn't raise his arm. No matter where he went, nothing helped, until he became a patient of Altered's physical therapist M. Babuch. At Altered, Afghanistan veteran S. Nichiporuk was completely cured of lameness and a spinal injury, and motorcyclist N. Usovich left his hospital bed and returned to a full life.

"And such examples are many," says A. G. Ruzhitskiy, commercial director of the Belorussian Center for Alternative Medicine. "We began operation in September of last year, and around 6,000 individuals have already undergone a course of treatment. I'd like to make it clear right from the start—we are a government facility, so don't compare us with the various cooperatives or other commercial organizations. Treatment at our facility is, in fact, for a fee, but the rates are quite acceptable.

"Our goal is to provide a high level of medical care to the population. The first steps have already been taken, and the relationship to the workplace has been revised. Our physician has a material interest in the end result, for what he gets paid for his labor depends on that. We have created a special social service that surveys the patients. From those surveys, we determine the physician's work rating. Those with high work ratings can receive two salaries in a month. The salaries, by the way, are financed—400 rubles, which is less than in a cooperative, but higher than in health care institutions.

I will not hide the fact that when we were getting set up, there were cases of falsifications and padding of figures. Those people were fired immediately: we value the honor of Altered and the high esteem people have for it. It is not easy to get a job with us, and roughly one out of every four who work for us is a doctor or a candidate of science; the rest are highly skilled physicians or practitioners who have a great deal of clinical experience. Many served their probationary period at the USSR Academy of Medical Sciences Moscow Center for Physical Medicine, whose director is eminent not only here in the USSR, but also abroad—A. B. Sitel.

Zeldin: Aleksandr Genrikhovich, does your center reject traditional treatment?

Ruzhitskiy: No. Our emblem testifies to that: a rounded triangle, with hands holding the sun. The rounded corners emphasize that our position is not pointed, I would say, not dogmatic. We feel that anything that produced a good outcome has a right to exist. That is why we don't confront modern medicine—it would be stupid to deny all the good that it has brought forth. The hands on our emblem represent the unity of word and deed—above all, practice. The sun is hope and the return to a full life.

The three corners represent diagnosis, all types of psychotherapy, and physical therapy.

But we are against the absolutization of traditional methods of treatment. As I already said, we are against the system that has come about in today's health care sector for how an individual relates to the workplace, because it ruins people. We are against a low level of medical service for the population, and against courselessness and callousness. A strict rule of ours is that the customer is always right.

The center practices alternative medicine. That includes the physical therapy used by the folk doctor Kasyan, acupuncture, biomechanical correction that uses various types of therapeutic physical conditioning and massage, psychotherapy, phytotherapy, naturopathy, diet therapy, and other nontraditional methods. They are successful in the treatment of a number of things, such as diseases of the cardiovascular and nervous systems, the stomach, and the respiratory tracts; sexual disorders; obesity; and spinal problems.

But before someone is treated, the correct diagnosis must be made. For that, we have highly skilled physicians and consultants, and soon we will get, under contract, the latest foreign diagnostic equipment. Unlike the ordinary polyclinic, we determine the cause of the problem, and then we give practical care immediately. You don't have to run around with prescriptions, searching the pharmacies for a drug that, to make things worse, isn't even available.

**Zeldin:** Everyone knows that phytotherapy is treatment with plant preparations and plants, and it is used successfully in traditional medicine...

**Ruzhitskiy:** Yes, but we take a different tack with it. First, we use phytotherapy in a holistic course of treatment with psychotherapy. Second, we are the first in the USSR to plan the use of the phytomodule for restoring the health not merely of the elite, but of anyone who needs it. Many medical people don't even know about the phytomodule. I'll explain it. A number of plants exude essential oils that have an effect on the human body. As a result of many years of scientific study, scientists have determined that certain groups of plants used alone or in combination produce an enormous therapeutic effect. You go into the room where the plants are, breathe the air, and after a few sessions you notice things like how much better your mood is, your sleep is, your appetite is. In the near future, there will be a room like that at the Minsk Automobile Plant, and there are similar agreements for the creation of such rooms at other enterprises, too. In the future, when we set up production on a large scale, we will be able to outfit offices and shops with phytomodules. We will be able to determine the combination of plants that energize or calm us in our own apartments.

We also use naturopathy widely—treatment with juices, grains, herbs, natural materials, and other natural gifts.

**Zeldin:** According to specialists, radiophobia is not diminishing in the republic, nor is the panic brought on by the aftermath of the Chernobyl accident. Apparently, people with those problems are also coming to you for help, true?

**Ruzhitskiy:** Yes, and they are many. The Chernobyl problem is one of the problems we encounter in our work. That is why we plan to purchase the latest equipment from abroad for determining the radionuclide content in the body. And along with that, we are beginning to treat quite a few such patients with psychotherapy and drugs that improve the body's metabolism and remove radionuclides.

Another area is the production of ecologically clean products, which is especially important for Belorussia. We have signed an agreement with one scientific enterprise that, with special technology, can harvest as much as 10 kilograms of root crops from one square meter. The technique was tested in the Navy, and fairly good results have been recorded on land. We also know that many people in the republic suffer from respiratory diseases and that bronchitis and asthma are widespread. That is why we are developing a large unit for psychotherapy and speleotherapy.

**Zeldin:** Aleksandr Genrikhovich, the readers would probably be interested in knowing the address and telephone number of your center.

**Ruzhitskiy:** Unfortunately, we are still experiencing certain difficulties getting a workspace. That is why we have concluded long-term agreements with the Minsk Automobile Plant, the motorcycle plant, the Belmedpreparaty Production Association, the Yakub Kolas print house, and other large enterprises and organizations. It's convenient for the workers, who can get highly skilled care right at the workplace, and it's convenient for us—we don't have to look for our own equipped location, because we work on their premises.

We have calculated that the costs to the enterprise for treatment of its workers for radiculitis or osteochondrosis, for example, are 2.6-3.4 times lower than if the workers took sick leave.

As yet, we have few treatment offices in Minsk, but there are a great many people who want to be treated by us. I can suggest that they mend their health in our sanatorium-preventorium in Kryzhovka. In addition to the usual staff workers, we have invited the best stomatologists, gynecologists, and other specialists who can provide effective medical care 24 hours a day. The price of admission to the sanatorium is 750 rubles.

**Zeldin:** But that's a big "chunk."

**Ruzhitskiy:** The treatment we offer is radically different from that of any other sanatorium not only in the way it is performed but in the quality. The price of admission includes 10 sessions each of physical therapy, massage, acupuncture, laser therapy, and psychotherapy. Upon

request, free consultations are given by ear, nose, and throat specialists, by psychologists, and by other specialists. Patients are fed only ecologically clean, high-calorie food products. That requires subsidies, and all kinds of taxes cost us quite a bit. Afghanistan veterans are admitted for half the price.

Soon, our services will be available in oblast centers and in other large cities where we are setting up branches. Staff members are being chosen on a competitive basis, and they will go through a probationary period in A. B. Sitol's center in Moscow. Our telephone number for information and suggestions are 96-55-53 and 25-92-95.

**Zeldin:** I get the impression that Altered can put any patient back on his feet.

**Ruzhitskiy:** We dream about that, but set about doing a treatment only after a painstaking diagnosis. If we can't help a patient, we tell him that frankly. The findings of our social service indicate that nearly all patients, before they come to us, have gone for help to various kinds of medical facilities. But there was no improvement in their condition. With us, on the other hand, only five individuals were unsatisfied with the results of our work out of 167 workers from the tanning plant in Gatov. We are not engaged in deceiving people, we are paid on the basis of the end result, we adhere to ethical principles, and we value the name of the center.

#### Immunity Stimulator

917C0526B Tallinn SOVETSKAYA ESTONIYA  
in Russian 22 Mar 91 p 3

[Article picked up from Baltiya-ETA: "Stimulator of Immunity:"]

[Text] A substance that mobilizes the body's strength to fight infectious diseases and other diseases has been produced from microscopic soil fungi in the laboratories of the biology department at the University of Latvia. It is a protein compound. Animal testing has shown that the substance, upon entering the liver, stirs the immune system and increases the activity of "devourers" of bacteria—macrophages. Moreover, the evoked protective response helps to destroy tumor cells and raises the body's resistance to radiation. At the moment, studies involving biologists, microbiologists, and clinicians are aimed at ascertaining the spectrum of action of the new biostimulator. "Promising and hope-inspiring..." is how the work was categorized by Docent Indriks Muyzniyeks, the head of the group of research associates who performed experiments with the biostimulator. He explained that the work could result in the creation of therapeutic and preventive drugs that are extremely effective in medicine and veterinary medicine.

#### First Soviet Pediatric Hematology Center for Leukemia Treatment

917C0526C Moscow PRAVDA in Russian 1 Jun 91  
Special Ed. "Detstvo" p 3

[Article by I. Voytko: "Bitter Sorrow...An Insidious Disease That Takes the Lives of 3,000 Children Every Year"; the author asks that her emoluments be transferred to the Hematologists of the World—For the Children bank account, No 334517; first two paragraphs are source introduction]

[Text] **Vanechka Aleshin** was alive for just four years, but how many hearts were wrung with grief as they accompanied him down that final path. He spent half his short life in the clinic of the hematology center in Minsk. All the personnel in the pediatric department fell in love with the boy.

The head of the department, Olga Vitalyevna Aleynikova has seen a lot of diseases in her career, and she's a brave soul. But when she spoke to us about the desperate struggle for the child's life, her voice faltered. For two years, no matter what happened, the medical people held out hope that they could rid Vanechka of the illness. And at times, victory seemed possible. But a miracle didn't happen. Leukemia is insidious and merciless.

What kind of a horrible disease is it? It steals up unnoticed, very quietly. Can a mother always be on the lookout for paleness, apathy, swollen lymph nodes, and loss of appetite in a child? It's the white blood cells, going wild, that begin to propagate uncontrollably and recolor the blood. Science gives many reasons for the appearance of leukemia. The main ones are those that are widely confirmed by chemistry—the water, the air, the food, the elevated radiation levels. Isn't that a lot of poison for a child's fragile body? Pediatricians have long been literally crying that the state of the environment is overcoming the adaptive capabilities of children. But who's listening to those voices?

The World Health Organization is noting a steady rise in oncological diseases in children. Here are the statistics for our country: every year, 11,000 children get cancer, and 6,000 of them die. Half of all tumors today are in the blood system. Out of every 100,000 kids, 14 have cancer, eight of whom have leukemia.

That tragic arithmetic has also begun to manifest itself in our editorial mail. The pile of letters on my work desk from parents who write about this misfortune is growing and growing. For a long time, I couldn't get near it—there's a shock to the letters, like a bare wire. Listen:

"Our only daughter, Lizochka, is only eight years old, and she's wasting away before our eyes—acute leukemia. For God's sake, help us..."

"My 10-month-old grandson is dying from leukemia. Take everything I've got—but save him..."

*"Chernobyl has destroyed my daughter and me. We've been to every part of Hell..."*

*"My son Anton Nikolayev is dying of blood cancer. We've been everywhere for it—to no avail..."*

I'd like to show you a letter from City School No. 2 in Selidovo, in Donetsk Oblast, in a little more detail. It has 350 signatures.

"Our student and friend Dima Svetash got leukemia. His father is a miner, his mother, a teacher. They are suffering unbearably—recently their youngest son died. Our doctors tell us that only abroad can one be saved from the disease. Help us! If only you knew what a bright, clean individual our Dima is."

Every letter has the entreaty to send the child to a clinic abroad. A diagnosis of leukemia for our children resounds like a death sentence. The clinics "around the corner" have already learned how to deal with the disease of the century. It's estimated that the number of children with leukemia among us and "over there" is the same.

But the statistics for those saved are striking. The American level is such that 70 percent of those with lymphoblastic leukemia survive (and the German figures are even higher). Our figure today is negligible—only 5 percent recover. I should note that many people don't believe that! The figure for survival in myeloblastic leukemia: zero.

The parents of the sick children are well aware of those figures. They see the demands, and the requests, and the calls for help with hard currency for treatment as the only chance for their children's salvation. Alas, seldom can anyone come up with hard currency. Treatment abroad costs between 50,000 and 100,000 hard-currency rubles. Can we send many children abroad at those prices? The chief of the Main Administration for the Welfare of Mothers and Children of the USSR Ministry of Health, I. Leshkevich, gave us a precise figure—last year, 83 children were able to go. What is this talk of equal social protection? It's clear that in the face of death, we are not all equal. The opportunity is with the rich.

And the rest, those who couldn't stir the pity of hard-currency sponsors? They are the hostages of our medicine. For many years, our health care has painted itself with bombastic slogans. Here's a comparison: the Americans spend more than \$500 billion every year for health care, while what we spend is too embarrassingly small to name. While we have been getting drunk on the notion that we are the chosen ones and on our ideals, the death rate of the "most privileged class" slid down to 52nd place on the world list.

Leukemia, it seems, has brought together all the woes of medicine, which is powerless in the face of it. The poverty of our health care stems from our economy in crisis and our social sphere brought to manual operation.

But what good is it to know why our doctors are helpless when a child is dying in your arms?

Twenty years ago, Western hematologists developed a program for treating leukemia. It has been adopted and used successfully in all the leading clinics of the civilized world. The treatment lasts nearly two years. And if the disease was not seriously neglected, it retreats at that point. The doctors say that the program itself is not complicated. But what you need for it: conditions that are as sterile as possible, the highest quality medications and equipment. After all, what does it take to do a marrow transplant? (In the treatment of leukemia, that absolutely must be done.) The individual's diseased hemopoietic immune system is killed, and a new one is generated.

We didn't begin doing such operations until 1988, at the All-Union Hematology Science Center. Of the 32 individuals who have undergone the operation, half are still alive. They are adults. We don't do the marrow transplant for children. Even though we know that leukemia is much harder to treat in adults. To this day, there is not even a special children's hematology clinic—just a department.

The predictions of the Japanese doctors are gloomy: an outbreak of leukemia is possible—probably within 20 years. Can't we believe physicians who have such tragic experience? According to official data, some 217,000 children live in the areas that were contaminated with dangerous levels of radiation from the Chernobyl accident. Then there are the areas around nuclear testing grounds and nuclear-waste burial sites.

We need emergency state-level measures, because the people abroad will help only a few of the thousands. Thank God, there is hope. The chief hematologist in the country, Aleksandr Grigoryevich Rumyantsev, should be given his due—he finally succeeded in getting a scientific research institute for children's hematology. Unfortunately, he did not succeed in getting a separate building for the complex. The children's hematology center uses the premises of three children's hospitals—the republic children's hospital and the first and third Moscow children's hospitals. Aleksandr Grigoriyevich himself has headed the center and attracted eminent specialists. His irreplaceable assistant is Professor Yelena Borisovna Vladimirskaia, who has devoted her entire life to the problems associated with leukemia in children. The center will have 180 beds. It will treat children with the most serious pathology.

We are sitting in the tiny office of Aleksandr Grigoryevich.

Everything points to the fact that Rumyantsev is someone who loves the language of action.

"Within three years," he says, "we will have a 50 percent survival rate."

"Can I take you at your word?"

"Certainly!"

"Yes, but after all, it won't be so easy to get into your center, either. The optimistic forecasts are again for certain..."

"For the time being, you're right. Right now, we have only six beds for the treatment that's come to be accepted in world practice. But our German friends are preparing an entire department. And they will outfit it. As early as the end of the summer, we will be able to open 60 beds. In addition, we intend to set up 10 more such centers in large cities. But..."

"No hard currency?"

"Catastrophically, none!"

Yes, the center is equipped primarily by charitable contributions. The statistics for our pediatric hematology, revealed only recently, touched the hearts of Western philanthropists. A great deal of help has arrived. The Krupp Fund in FRG has already trained more than 10 Soviet specialists for the center. Eight more are getting ready to go for training. Fifteen nurses are being trained in FRG and France. The center has received the solid support of Japanese businessmen and the association called the Physicians of the World.

The international association called Hematologists of the World—For the Children has been set up at the center. The association was founded by the international organizations Aid for Chernobyl, Employers for Future Generations, the Soviet Charity and Health Fund, the Soviet Children's Fund, and the Sasakawa Fund (Japan). President M. S. Gorbachev's wife has deposited \$100,000 in the association's account and has served as head of the Hematologists of the World—For the Children. The association's account numbers are No 334517 in the Moscow bank Optimum (for rubles) and No 18002653 in the Vneshekonombank SSSR [USSR Foreign Economic Bank] (for hard currency).

An international symposium of pediatric hematologists took place at the end of April in Minsk. For four days, the leading specialists from Western clinics spoke of their experience. For those of our physicians who took part in that high-level symposium, those days served as revelations and valuable lessons. A professor whose name enjoys worldwide eminence, Kornkuber, began his own address with the words "I myself am sick. I have the Minsk syndrome, and to my dying day I will devote my strength and my knowledge to this, and I will share what I know with everyone."

O. Aleynikova has "infected" Swiss and French hematologists with the Minsk syndrome. Two years ago, she overcame incredible difficulties and raised enough hard currency to take two children to FRG for treatment. They didn't make it to Germany. "That's when I realized," says Olga Vitalyevna, "that the hopes we've pinned on foreign clinics are delusive."

I spoke with that amazing individual for two hours. I couldn't begin to enumerate all that she is doing—and doing successfully.

I cannot hide my admiration for Olga Vitalyevna Aleynikova. She lives her life sparing no efforts, performing the miracle of saving every day, every hour. She never hoists the white flag, she just continues to fight against the disease. May heaven send you strength, sweet person! May your heart never be overcome with fatigue.

I am walking down the corridor of the hematology center. I walk with my teeth clenched from pain and sorrow. The little children here roam about like shadows. The guilt I feel before them will always be with me. Faces ever so thin, transparent to a bluishness. They look at adults with hope and trust.

#### Soviets Plan Production of Genetically Engineered Insulin in 1992

917C0526D Alma-Ata LENINSKAYA SMENA  
in Russian 4 Apr 91 p2

[Article by I. Fatkuldinova, Tselinograd Oblast: "Some Secrets From the Secret 'Progress': 'We Are Not Making Biological Weapons,' Assures V. Lepeshkin"]

[Text] In fact, it was almost an accident that I ended up at the Progress Production Association. I didn't even suspect that in Stepnogorsk, which isn't even on the map, there is a large, modern microbiological production plant. And I have every reason to believe that only a small circle of Kazakhstanis are apprised of the history of its creation and existence.

But among the people of Stepnogorsk, Progress evokes a host of rumors, gossip, and reservations. The topic of the production of secret biological weapons at the production association knows a great deal of exaggeration. The arguments proving that, which are almost convincing, are many—a secret vivarium, the workers wear clothing that's similar to what the cosmonauts wear, the great number of secret State Prize laureates, etcetera.

I passionately want to believe all that. Or better yet—I'd like to find just a tiny clue that would unravel the tangle of proofs and denunciations. I'd just love to uncover something sensational! But alas, I didn't descend into any top-secret laboratories, with or without a cosmonaut's suit. To my profound disappointment, the entire vivarium contained 20 rabbits and a little over 30 guinea pigs. There weren't even any mice or rats. And as for State Prizes—I confess, I forgot to ask. But honest, there wouldn't be anything wrong with giving them to the people who produce for our needs that which the director of the Stepnogorsk Scientific Experimental Production Facility of the Progress Production Association, Gennadii Nikolayevich Lepeshkin, told me about.

But first, a little history. Construction of Progress in Stepnogorsk began in 1970, by a special decree of the CPSS Central Committee and the Council of Ministers.

It was intended as a large plant for manufacturing microbiological plant-protection agents and antibiotics for the needs of animal husbandry. The construction work that began in 1971 was completed in three years, and in 1975, the first preparation was brought "up to the surface"—it was enterobacterin.

That plant has now grown and has become a production association, and it is the largest enterprise of the microbiological industry in Kazakhstan. And today, Progress consists of two independent structural units—the plant itself, and a scientific experimental production facility.

It is that experimental production facility, which is better known in broad circles as some mythological, super-secret research institute, that serves primarily as food for the imagination. Even though it's the plant itself that makes for most of the unpleasantries for the city's residents, with its smells and releases.

The experimental production facility is only partially linked to the products that are manufactured by the plant. To apivite [apivit], for example, for treating bees. The Baltic states buy that preparation in vast quantities. Last year, Georgia took 300 liters. Now it wants the delivery to be boosted to 500 liters. But in Kazakhstan, only the Kokchetav Oblast orders it, in modest quantities.

But the most interesting thing at the experimental production facility has to do with its primary activity—the development and implementation of new, genetically engineered medical preparations and promising technologies.

The first technology for producing genetically engineered insulin in the USSR was developed here. Some 6 percent of the population of our country suffers from diabetes mellitus. They need that scarce preparation every day. But the quantity needed for one course of treatment for one individual requires the pancreases from 40 cows or 70 pigs. Anyone can see that increasing the output of such a drug would be very difficult in the USSR today. Not to mention the fact that animal insulin is of low quality and causes side effects.

And so this genetically engineered insulin is "simply science fiction." Today, the only firms in the world that have set up its industrial manufacture are Eli Lilly in the United States and Novo in Denmark. Progress will manufacture its first industrial batch of insulin with its own technology, on its own domestic sorbents and nutritive bases, in 1992. Children will be the first in line to receive it, and then everyone else will get it.

What other consumer goods are being manufactured at the experimental production facility or are about to be put into production? The list would go on and on: the cancer drug reaferon; thymidine for the drug used in the treatment of AIDS; the first Kazakhstan antibiotic—roseofurin; the preparation Zdorovye, with carotene, for preventing oncological diseases.

And perhaps you'd be interested in knowing that they are beginning the manufacture of disposable syringes here! Or that they are starting to produce preparations based on natural ginseng—tinctures and shampoos.

They say that if the highly effective preparation profezin had been used in the Ufa tragedy, when two railroad cars caught fire, the number of people who died from burns would have been far smaller. And that preparation has been manufactured at Progress since 1990. Profezin heals wounds 4-5 times faster than do the preparations that are usually used. There is nothing else like it in the world.

Here, there is truly so much that is unique. So much so that I'm not even ashamed to use the popular pun "Progress promotes progress."

The experimental production facility was created in the early 1980s to meet the most modern requirements. And some of its sectors are on a par with recent world standards. Its buildings contain some excellent domestic equipment, and its laboratories have a great deal of imported equipment for the production of, for example, insulin and reaferon.

A little over 800 highly skilled specialists take care of everything at the facility—about 50 of them are research associates; 15 are candidates of science, one is a doctor of science, and another is about to become a doctor of science.

There's much that's very curious there. It's too bad that it's all accessible to only a very small circle of people. Understandably, of course, it's not just that man needs to be protected from the microbes, no less protection is needed by the bacteria—and especially with such expensive preparations, whose price per gram is as high as several tens of thousands of rubles.

But why is it so difficult for information about all this to make its way into print? Why aren't representatives of the committee for ecology and the environment allowed into the plant to independently monitor for releases of harmful substances?

"Today, the general awareness and the mood of the people in the region against microbiological production is deepening," says V. Isakin, chairman of the municipal committee for ecology. "The external factor—the smell—affects everyone. It affects those who pass by the plant, those who work there, and especially those who live in the settlement of Zavodskaya. If the wind is blowing in a certain direction, the smell gets on your nerves round the clock. In that kind of situation, you need to meet the people face to face, open all your doors, win the people's trust. Only openness can make things better."

It's hard not to agree with Vitaliy Sergeyevich [Isakin].

### Draft Law on Compensation for Blood Donors

*917C0526E Moscow ARGUMENTY I FAKTY  
in Russian No 19, May 91 p 6*

[Article by V. Gnatyuk, who answers question posed by three readers, under the rubric "Question and Answer": "Why is the Number of Donors Dropping in the Country?"; first two paragraphs are source introduction; Gnatyuk's answer consists of the first paragraph after introduction]

[Text] *The number of donors in the country is diminishing every year. For those who give their blood today for free, there are no guarantees for the protection of their health in these days of scarce drugs and products. Paid donors receive pitiful compensations. When is a law on donorship going to be adopted in the USSR?*

*R. Danilchenko, L. Paziy, V. Bliznyukova  
Honorable Donors of the USSR, Artemovsk*

**Answering that question here is the secretary of the Committee for the Protection of Public Health of the USSR Supreme Soviet, V. Gnatyuk.**

The draft law on donorship that was sent to our committee by a group of USSR people's deputies needed some revision from a juridical standpoint. The draft was transmitted for approval to the Cabinet of Ministers and then to all the ministries concerned. The law could possibly be adopted at the next session of the USSR Supreme Soviet.

**Here is what the USSR Ministry of Health reported to us.**

Those who give blood today for free (they comprise 80 percent of blood donors) are usually compensated for food, on the average, 3 rubles 90 copecks (for 400-450 grams of blood). Local Soviets are trying now to raise that compensation to 6 rubles per blood donation. Plus two days off from work, counting the day blood is given.

Active, or paid, donors today get roughly 50-60 rubles per liter of blood. Regulations allow donors to give blood five times a year, at 400-450 grams per session.

The laws give donors today no benefits or privileges for medical care or for the acquisition of goods that are in short supply. They have no additional rights, and the title "Honorable Donor of the USSR" is conferred to those who give 16 liters of blood or more for free.

**From the Editor.** Because rights and privileges are not legislated for donors in this country and because donors are not beneficial to enterprises, the number of donors in the USSR has dropped in recent years by 30 percent. Here are the figures on a republic-by-republic basis:

	Number of Donors, in thousands	
Republic	Year:1985	Year:1989
RSFSR	5624.0	3984.1
Ukraine	2625.6	1949.3

Belorussia	545.8	371.4
Uzbekistan	616.1	455.4
Kazakhstan	810.3	683.0
Georgia	141.1	84.9
Azerbaijan	161.4	73.1
Lithuania	196.9	141.1
Moldova	256.2	217.6
Latvia	160.3	93.7
Kirghistan	176.4	169.5
Tadzhikistan	150.2	120.7
Armenia	130.6	64.0
Turkmenia	107.7	107.1
Estonia	52.2	39.6
USSR	11,754.8	8554.5

### Child Health Statistics

*917C0526F Moscow PRAVDA in Russian 1 Jun 91  
Special Ed. "Detstvo" p 3*

[Article with no byline: "In the Mirror of Statistics"]

[Text] The health of the children is the health of the nation; and our children's health is causing a great deal of alarm. Of the 5,062,000 children born in the USSR in 1989, every fifth one is sick, and more than 70,000 have congenital anomalies. A total of 219,730 children 18 or under have died.

Some 15-20 percent of preschool children suffer from chronic diseases. Only 20-25 percent of children are essentially healthy the day they finish school.

One of the most serious problems in child health care involves invalid children. They constitute 4.5 percent.

Today, only a third of all the children who need special education are in the 2,800 special schools. There is virtually no unified social support for such children in this country. It is those adolescents who account for many crimes. Right now, some 1.1 million of these children 14 or under are on the records of law enforcement agencies.

The absolute figure for the amount of money allocated by the state for the upbringing, education, and health-protection of the forthcoming generation is 33.5 million rubles. That is equal to one-third of the official military budget of the USSR.

Statistical analysis indicates that over the past 20 years, the rates of growth of the spending for children are lower than the rates of growth of the national income. The percentage of growth of the nation's spending for school is decreasing. Since 1960, the spending for schools has dropped from 7 percent of the national income to 2.7 percent. We rank sixtieth in the world in that regard.

Nearly 2 million children are on a waiting list for kindergartens or day nurseries. Three million have gotten in, but such facilities are short of "working space" by as much as 20 percent. In every fifth such facility, there is no running water or central heating; in every third, no plumbing.

Infant homes, children's homes, and boarding schools house a total of 163,500 kids; a total of 524,400 children

are adopted, and 289,900 are under wardship. But only 9.4 percent of the total number of children in children's homes and boarding schools have no so-called biological parents.

However, children living in families are often left to their own devices. At present in this country, approximately 13.5 million children are growing up with no fathers.

**Heterogeneity of Influenza A and Antibody Avidity**

917C0269A Moscow VOPROSY VIRUSOLOGII  
in Russian Vol 35 No 5, Sep-Oct 90 (manuscript  
received 05 Apr 90) pp 367-370

[Article by S. B. Kolotvinov, L. I. Akhmetova, I. P. Manova and S. S. Galitarov, Sverdlovsk Medical Institute, RSFSR Ministry of Health; All-Union Scientific Research Institute of Influenza. USSR Ministry of Health, Leningrad]

UDC 616.98:578.832.1]-07:616.153.96-097-078.33

[Abstract] A series of influenza A (H3N2) viruses isolated in 1978-1980 and 1985 were used for immunization of 120 g Wistar rats and 10-12 g BALB, C57BL, and CBA mice in order to correlate antigenic and cultural heterogeneity with antibody avidity. Passive hemagglutination inhibition studies with the antisera demonstrated that the various isolates could be differentiated on the basis of marked differences in antibody avidity, and that antibody avidity was related to transmission of a single hemagglutinin gene between recombinants. In addition, immunization of CBA mice with isolates inducing the production of avid antibodies imparted a greater degree of protection against murine pneumotropic strains. Evidently, the ability to generate avid antibodies should be a criterion in selection of influenza A strains for vaccine reduction. Figures 2; tables 3; references 20: 14 Russian, 6 Western.

**Monoclonal Antibody in Analysis of Influenza B Hemagglutinins**

917C0269B Moscow VOPROSY VIRUSOLOGII  
in Russian Vol 35 No 5, Sep-Oct 90 (manuscript  
received 27 Sep 89) pp 376-379

[Article by A. L. Platonova, Z. I. Rovnova and R. Ya. Podchernyayeva, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

UDC 578.832.1:578.74].083.3

[Abstract] Monoclonal antibodies generated against influenza B/Oregon/5/80 virus were used for antigenic analysis of influenza B virus hemagglutinins in passive hemagglutination and solid-phase ELISA. The resultant data confirmed previous studies with polyvalent antisera demonstrating type- and group-specific antigenic determinants. In addition, the results with the monoclonal antibodies led to the identification of three additional group-specific hemagglutinin epitopes in influenza B viruses isolated in 1970-1979, 1970-1984 and 1970-1986. Tables 2; references 23: 10 Russian, 13 Western.

**Hantaan Virus Serotypes in Far Eastern USSR**

917C0269C Moscow VOPROSY VIRUSOLOGII  
in Russian Vol 35 No 5, Sep-Oct 90 (manuscript  
received 5 Apr 90) pp 391-393

[Article by R. A. Slonova, Ye. A. Tkachenko, T. I. Astakhova and T. K. Dzagurova, Scientific Research Institute of Epidemiology and Microbiology, Siberian Department (Vladivostok) and Institute of Poliomylitis and Viral Encephalitides (Moscow), USSR Academy of Sciences]

UDC 616.61-002.151-022:578.833.29]-031.84]-078.33

[Abstract] Immunofluorescence and neutralization tests were conducted on Hantaan viruses isolated from patient suffering from hemorrhagic fever with renal syndrome (HFRS) and from rodents in Primorskiy Kray to assess the serotype spectrum. The results demonstrated the five serotypes circulate in Primorskiy Kray and that rodents served as nonspecific carriers. Consequently, field mice and voles (*Clethrionomys rufocanus*) were implicated as vectors in human cases of HFRS in Primorskiy Kray. Tables 4; references 7: 2 Russian, 5 Western.

**Comparative Analysis of Sindbis Virus and Karelian Fever Virus Polypeptides**

917C0269D Moscow VOPROSY VIRUSOLOGII  
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[Article by L. V. Uryvayev, A. Yu. Zlobin, L. K. Berezhina, K. S. Ionova, O. P. Glushchenko, N. A. Parasyuk, T. M. Skvortsova and D. K. Lvov, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

UDC 578.833.11:578.1:577.112.5

[Abstract] Pulse-chase experiments were conducted on tissue cultures infected with Karelian fever virus (Kfv), strain Leiv-9298, which led to the identification of a series of viral polypeptides. In addition, the similarities of three of the peptides (E1, E2, C) to peptides of Sindbis virus AR339 in terms of MW and pI, and the results of neutralization tests with hyperimmune sera, pointed to close relatedness between Sindbis and Kfv. Consequently, it appears that Kfv Leiv-9298 may well be another variant of the Afro-European complex of Sindbis virus. Figures 3; tables 1; references 15: 5 Russian, 10 Western.

**Production and Analysis of Recombinant Monoclonal Antibodies Against Lassa Virus**

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[Article by A. S. Vladyko, L. Ya. Kunitskaya, S. I. Bistrova, A. G. Krasko, N. N. Lemeshko and I. S.

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UDC 615.373.03578.833.26.083.33].012

[Abstract] Recombinant monoclonal antibodies were generated against Lassa virus employing splenocytes from immunized BALB/c mice and Myeloma X-63. A total of 18 stable hybridomas were obtained, with four selected for detailed analysis by indirect fluorescence antibody, ELISA and radioimmunoprecipitation techniques. The results showed that the antibodies differed in reactivity, depending on the analytical technique employed, and that the activities of the monoclonal IgG antibodies were unrelated to the isotype. Figures 2; tables 1; references 15: 2 Russian, 13 Western.

#### **Virulence of Tick-Borne Encephalitis Virus in Primorskiy Kray**

917C0269F Moscow VOPROSY VIRUSOLOGII in Russian Vol 35 No 5, Sep-Oct 90 (manuscript received 2 Nov 89) pp 399-401

[Article by G. N. Leonova, S. M. Muratkina and S. P. Kruglyak, Scientific Research Institute of Epidemiology and Microbiology, Siberian Department, USSR Academy of Medical Sciences, Vladivostok]

UDC 578.833.26:578.72

[Abstract] Virulence determinations were performed on tick-borne encephalitis (TBE) virus isolates obtained in Primorskiy Kray in 1970-1987. The trials were conducted on 3- to 4-week-old mice and Syrian hamsters injected with 115 TBE virus strains isolated from ixodid ticks, rodents, blood and brain specimens from deceased patients. The results demonstrated that the mammalian isolates were essentially highly (76.5 percent) and moderately (23.0 percent) virulent. The tick isolates were

more heterogenous, with 59.5 percent of the viral isolates shown to be highly virulent, 31.5 percent moderately virulent, and 9.2 percent weakly virulent. Viral heterogeneity was also evident in the degree to which antibody-forming cells were suppressed and in the zone effect on s.c. injection of mice. In addition, the incidence (72.7 percent) of highly virulent isolates obtained in the eastern regions of the Primorskiy Kray was higher than in the southern region (40.6 percent). The data were consistent with findings that the viral mNsc marker is an indicator of virulence. Tables 2; references 9: Russian.

#### **Molecular Probes in Hepatitis A Virus (HAV) Detection**

917C0383C Moscow VOYENNO-MEDITINSKII ZHURNAL in Russian No 11, Nov 90 pp 40-42

[Article by P. O. Vyazitskiy, USSR State Prize laureate, professor, lt. general, med. corps, V. S. Perepelkin, cand. med. sci., maj. general, med. corps, and I. A. Volchek, cand. med. sci., major, med. corps]

UDC 616.36-002.12/14-036.22

[Abstract] Northern blots were conducted on several hundred biological samples obtained from civilians and military personnel with hepatitis A in order to determine incidence of occurrence of the HAV genome. In general, using a DNA probe directed against genome sequence encoding protein P1 of HAV, resulted in demonstration of the virus in saliva, urine, feces and blood. The results showed that, for example, in 9.1 percent of the patients HAV persisted in saliva for four months and in 2.9 percent for six months. The study led to reassessment of the prevalent view in military medicine that former patients present a negligible risk of infection. In addition, the study also showed that in half of the Soviet patients the virus could be detected as early as three weeks in various specimens before the onset of clinical hepatitis. However, in some cases the elapsed time between first detection of the HAV genome and frank disease was on the order of 10 months. References 1: Russian.

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